

SHARP

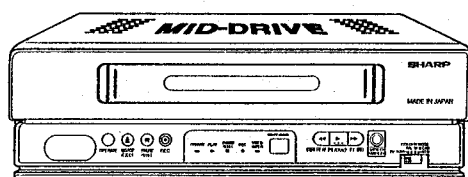
# SERVICE MANUAL

## 维修手册

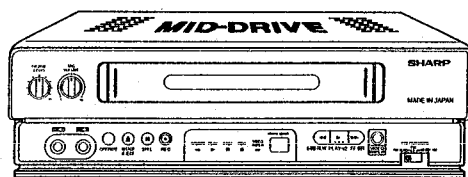
SX4G4VC-M2E//

VHS VIDEO CASSETTE RECORDER

VHS 盒式磁带录象机



VC-M2E/M7E



VC-M33E/M33DR

# VC-M2E

# VC-M7E

# VC-M33E

# VC-M33DR

MODELS  
型 号

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

为了使用者的安全 (有些国家用安全规定加以要求), 修理本装置时必须完全保持其原有配件状态, 更换只得使用规定者。

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SHARP CORPORATION

## PRECAUTIONS IN PART REPLACEMENT

*When servicing the unit with power on, be careful to the section marked white all over.*

*This is the primary power circuit which is live.*

When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.

Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

**(1) Start and end sensors: D804 and D803.**

Insert the sensor's projection deep into the upper hole of the holder (LHLDZ1893AJ00). Referring to the PWB, fix the sensors tight enough.

**(2) Photocoupler RH-FX0005GEZZ: IC902**

Refer to the symbol on the PWB and the anode marking of the part.

**(3) Cam switches A and B (RH-PX0231GEZZ): D809 and D808.**

Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

**(4) Take-up and supply sensors (RH-PX0232GEZZ): D801 and D802.**

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

**(5) Diode bridge (RH-DX0083GEZZ): D901.**

Adjust the + marking of the part to the symbol's cathode marking on the PWB.

## 零件更换时的注意事项

在需要对本录象机进行带电保养检查时，对所有注有白色标记的部分均应特加小心注意。

注有白色标记的部分为初级电源电路部分。

在进行走带状况检查调整过程中检查印刷电路板焊线面时，应先确认磁带的装挂状态符合要求，再边注意初级电源电路边翻转其印刷电路板进行检查。

如更换了零件，将盒室机构及其印刷电路板安置就位后，重新进行调整。

(1) 带头、带尾感应器：D804、D803

将两感应器的凸销分别深插于插座(LHLDZ1893AJ00)上面插孔之中，并相对于盒室机构分别将其紧固之。

(2) 光电耦合器(RH-FX0005GEZZ)：IC902

参照盒室机构印刷电路板以及该部件阳极端标记。

(3) 凸轮开关A和B (RH-PX0231GEZZ)：D809和D808

调该部件的槽口部于盒室机构印刷电路板的白色标记处。扣紧之，切勿让其产生任何松动。

(4) 卷带盘、供带盘感应器(RH-PX0232GEZZ)：D801和D802

参照盒室机构印刷电路板上的所有标记，切勿混淆这两个感应器的设定方向。扣紧之，切勿让其产生任何松动。

(5) 二极管电桥(RH-DX0083GEZZ)：D901

调该零件的+标记于盒室机构印刷电路板上的阴极处。

## 1. SPECIFICATIONS

Format:	VHS PAL/MESECAM standard (VC-M2E/M33DR) VHS PAL/MESECAM/NTSC 3.58/NTSC 4.43 standard (VC-M7E) VHS PAL/MESECAM/NTSC 4.43 standard (VC-M33E)
Video recording system:	Two rotary head helical scan system
Video signal:	PAL/SECAM colour or monochrome (VC-M2E/M33DR) PAL/SECAM/NTSC 3.58/NTSC 4.43 colour or monochrome (VC-M7E) PAL/SECAM/NTSC 4.43 colour or monochrome (VC-M33E)
Recording playing time:	240 min. max. with SHARP E-240 tape (PAL/MESECAM: SP mode) 160 min. max. with SHARP T-160 tape (NTSC: SP mode)
Tape width:	12.7 mm
Tape speed:	23.39 mm/s (PAL/MESECAM: SP mode) 33.35 mm/s (NTSC: SP mode)
Antenna:	75 ohm unbalanced
RF converter output signal:	UHF Channel E30 - E39 Preset to E39 (VC-M2E/M7E/M33E) UHF Channel E31 - E40 Preset to E38 (VC-M33DR)
Power requirement:	AC110V-240V, 50/60Hz (VC-M2E/M7E/M33E) AC200V-240V, 50/60Hz (VC-M33DR)
Power consumption:	Approx. 13W (VC-M2E/M7E/M33E: AC110V~240V/50Hz) Approx. 13W (VC-M33DR: AC200V~240V/50Hz)
Operating temperature:	5°C to 40°C
Storage temperature:	- 20°C to 60°C
Weight:	3.1kg
Dimensions:	330mm (W) × 280mm (D) × 92mm (H) (VC-M2E/M7E) 330mm (W) × 285mm (D) × 92mm (H) (VC-M33E/M33DR)
Video	
Output:	1.0 Vp-p, 75 ohm
Audio	
Output:	0 dBs = 0.775 Vrms
Output:	Line: - 8 dBs, 1k ohm
Accessories included:	75 ohm coaxial cable Operation Manual Infrared remote control Microphone (VC-M33E/M33DR) Battery

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.
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**Note:** The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.



## 1. 规格

- 形式：VHS（家庭用录象机）PAL/MESECAM标准型（型号VC-M2E/M33DR）  
VHS（家庭用录象机）PAL/MESECAM/NTSC3.58/NTSC4.43标准型（型号VC-M7E）  
VHS（家庭用录象机）PAL/MESECAM/NTSC4.43标准型（型号VC-M33E）
- 视频记录方式：双旋转磁头螺旋形扫描方式
- 视频信号：PAL/SECAM制式彩色及黑白信号（型号VC-M2E/M33DR）  
PAL/SECAM/NTSC3.58/NTSC4.43制式彩色及黑白信号（型号VC-M7E）  
PAL/SECAM/NTSC4.43制式彩色及黑白信号（型号VC-M33E）
- 记录再现时间：夏普E-240录象磁带最大240分钟（PAL/MESECAM制式：SP标准转速方式）  
夏普T-160录象磁带最大160分钟（NTSC制式：SP标准转速方式）
- 磁带带宽：12.7毫米
- 走带速度：23.39毫米/秒（PAL/MESECAM制式：SP标准转速方式）  
33.35毫米/秒（NTSC制式：SP标准转速方式）
- 天线：75欧姆，非平衡式
- 射频变换器输出信号：UHF（超高频）频道E30～E39，出厂预设为频道E39（型号VC-M2E/M7E/M33E）  
UHF（超高频）频道E31～E40，出厂预设为频道E38（型号VC-M33DR）
- 电源：交流110伏～240伏，50/60Hz（型号VC-M2E/M7E/M33E）  
交流200伏～240伏，50/60Hz（型号VC-M33DR）
- 消耗功率：约13瓦（型号VC-M2E/M7E/M33E：交流110伏～240伏/50Hz）  
约13瓦（型号VC-M33DR：交流200伏～240伏/50Hz）
- 工作温度：5℃～40℃
- 存放温度：-20℃～60℃
- 重量：3.1公斤
- 尺寸：330(宽)×280(深)×92(高)毫米（型号VC-M2E/M7E）  
330(宽)×285(深)×92(高)毫米（型号VC-M33E/M33DR）
- 视频信号  
输出：1.0V<sub>p-p</sub>, 75欧姆
- 音频信号：0分贝=0.775伏均方根值  
输出：线路输出：-8分贝，1千欧姆
- 附属品：75欧姆同轴联接电缆  
使用说明书  
麦克风（型号VC-M33E/M33DR）  
电池

由于产品不断更新换代，有不经预告而改变设计及其规格的情况。

注：天线应使用符合DIN45325(IEC169-2)新标准的带有75欧姆连接器的UHF/VHF型天线。

## 2. DISASSEMBLY AND REASSEMBLY

### 2-1 DISASSEMBLY OF MAJOR BLOCKS

**TOP CABINET  
FRONT PANEL**

- : Remove 2 screws ①.
- : Remove 2 screws ②. Remove 7 clips ③. Remove the FRONT PANEL and 2 knobs ④ at the same time. Be careful not to lose slide knob ⑤.

**PWB HOLDER  
(VC-M33E/M33DR)**

- : Remove 1 screw ⑥.

**KARAOKE PWB  
(VC-M3E/M33DR)**

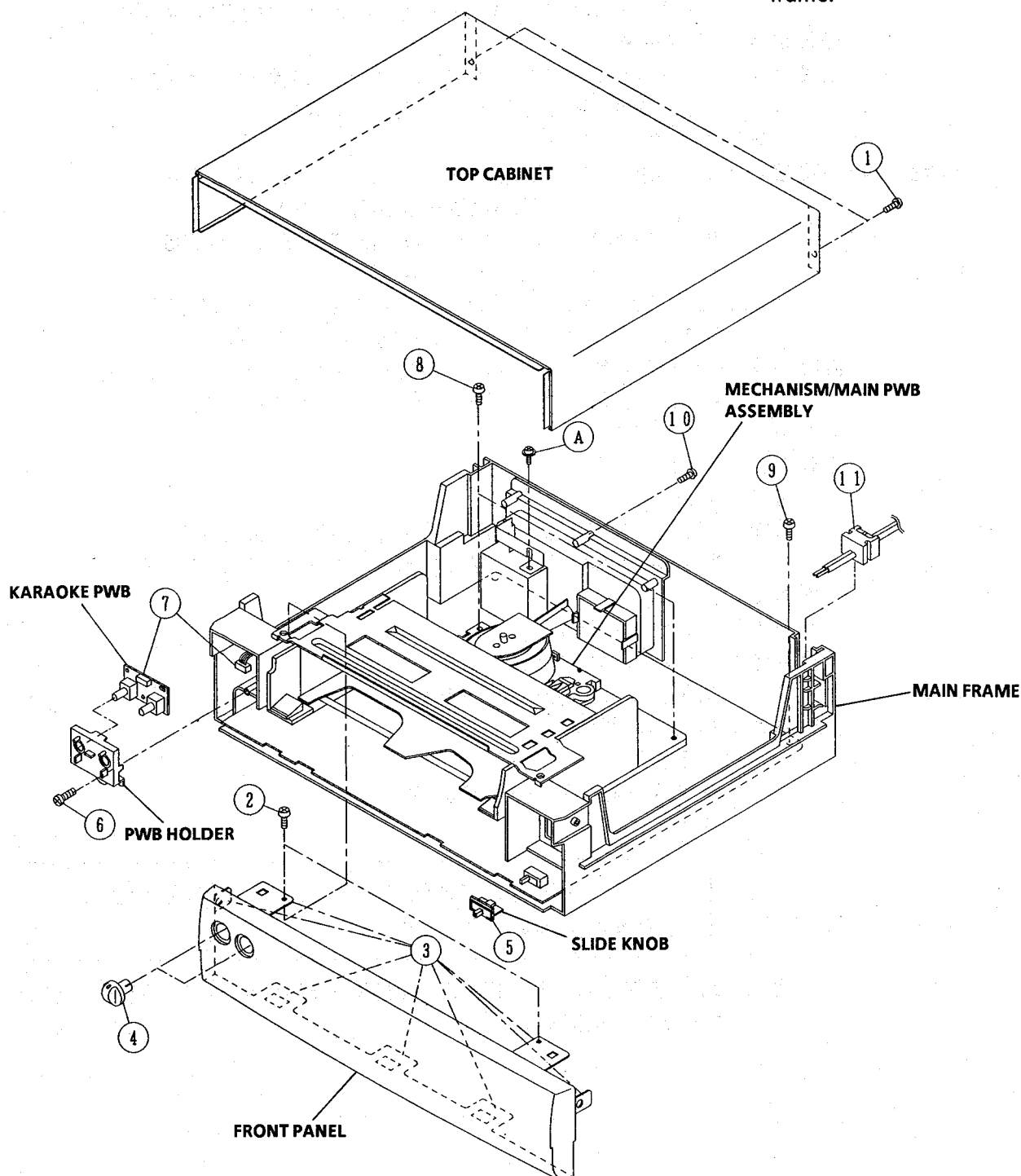
- : Remove the harness ⑦.

**CABINET EARTH  
ANGLE**

- : Remove 1 screw ⑧.

**MECHANISM/  
MAIN PWB  
ASSEMBLY**

- : Remove 2 screws ⑨, 1 screw ⑩ and 1 grommet ⑪. Lift the rear end of the mechanism/main PWB assembly and take it out of the main frame.



## 2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

### ANTENNA TERMINAL COVER

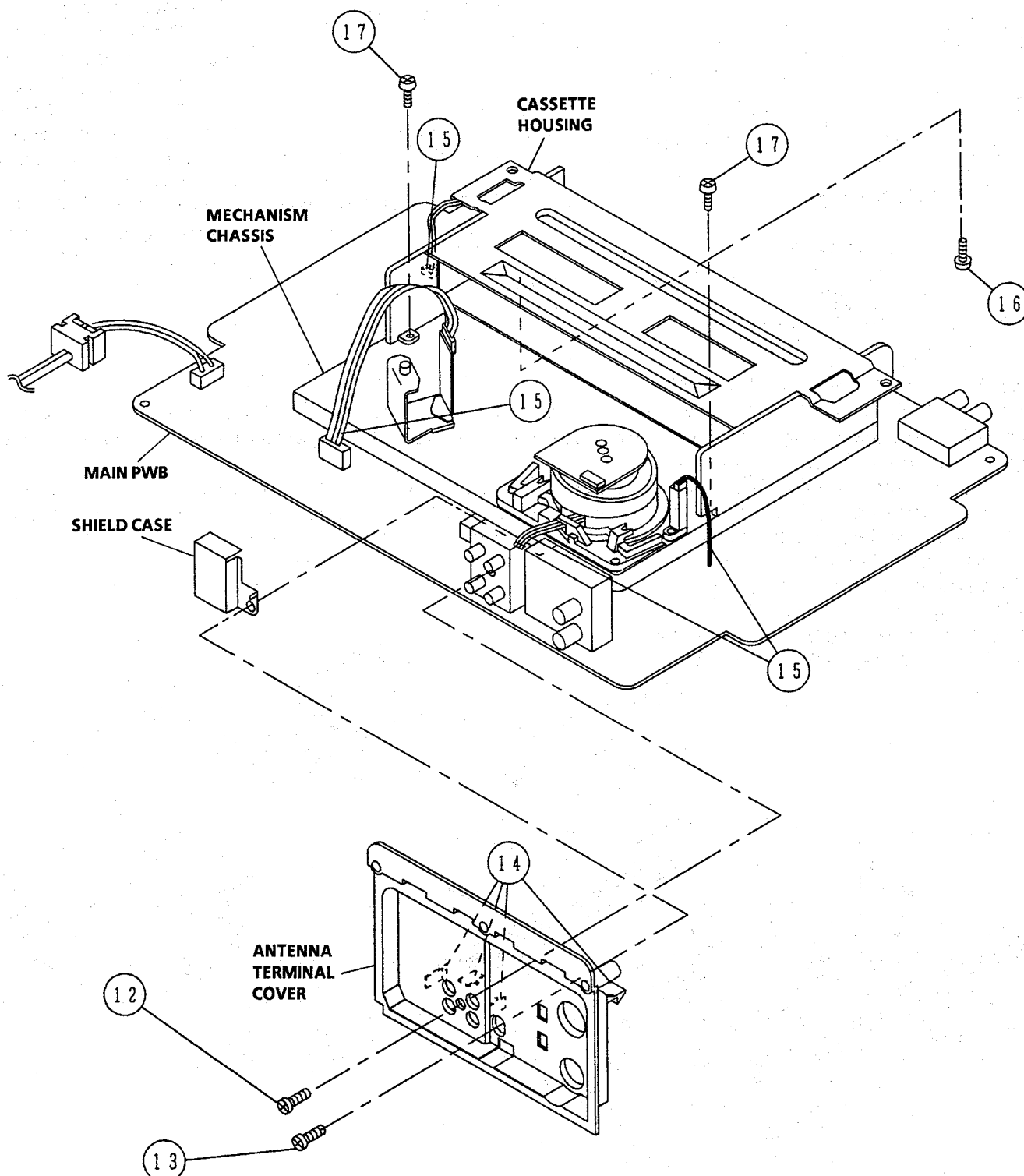
: Remove 1 screw ⑫, ⑬ and 4  
clips ⑭.

### MECHANISM CHASSIS/ CASSETTE HOUSING ASSEMBLY

: Remove shield case.  
Remove 2 FFCs and 2 harnesses  
⑮.  
Be carefull not to confuse the  
top and bottom of the FFC.

### CASSETTE HOUSING

Remove 1 screw ⑯.  
Remove the mechanism  
assembly straight up from the  
main PWB with care not to  
damage their surrounding  
parts.  
: Remove 2 screws ⑰.



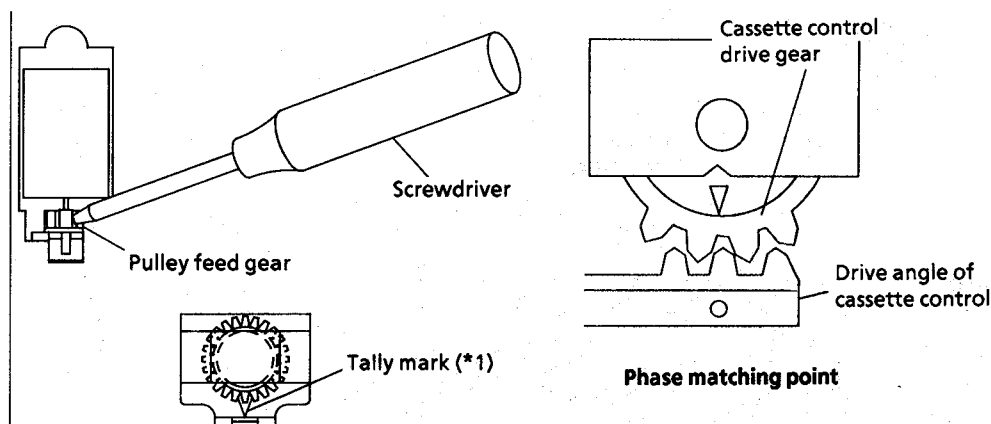
## 2-3 PRECAUTIONS IN REASSEMBLING

### MOUNTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

#### Electrical setting:

Making a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor and be sure that the mechanism is back to its initial setting position (\*1). Now place the cassette controller in position. (This method is used when the mechanism has been already set on its PWB.)



#### Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (\*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

### COUPLING THE MECHANISM TO THE PWB

Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

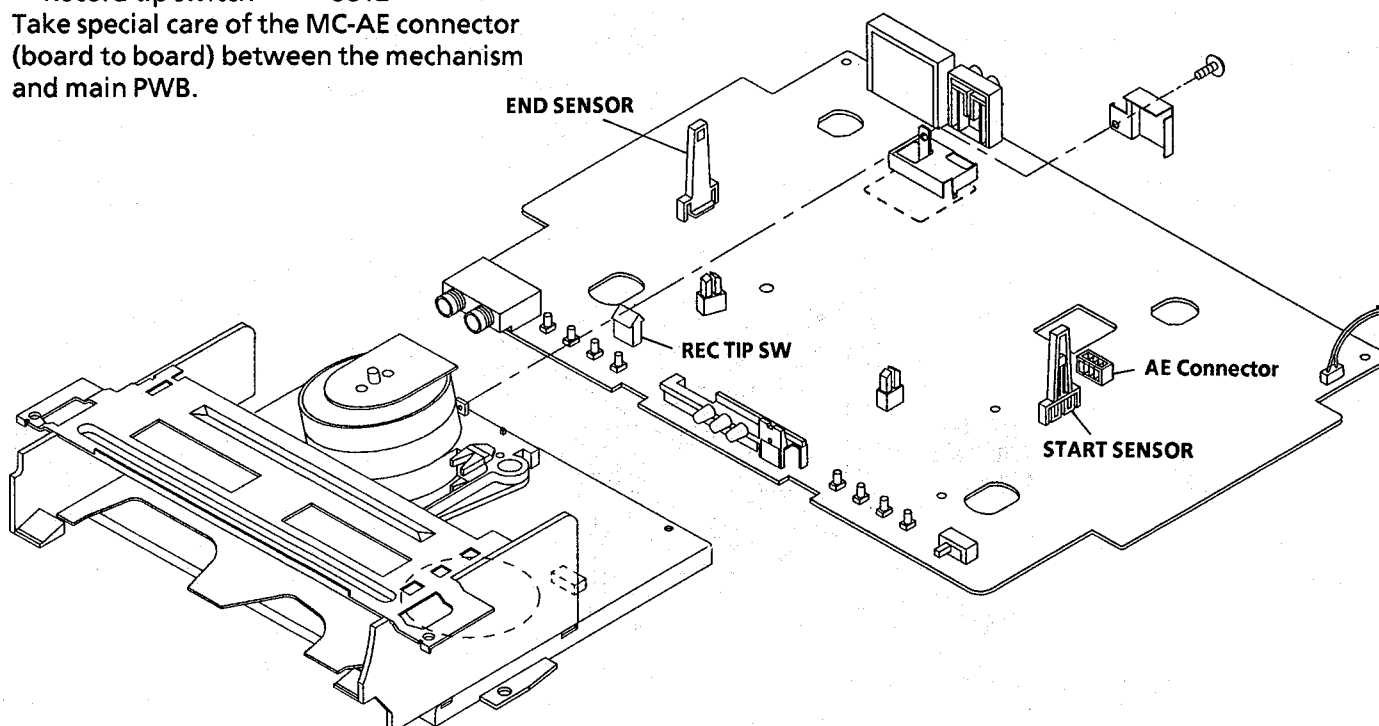
Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AN and AS) and harnesses (AB and AJ) between the mechanism and main PWB.

#### Parts to pay attention to:

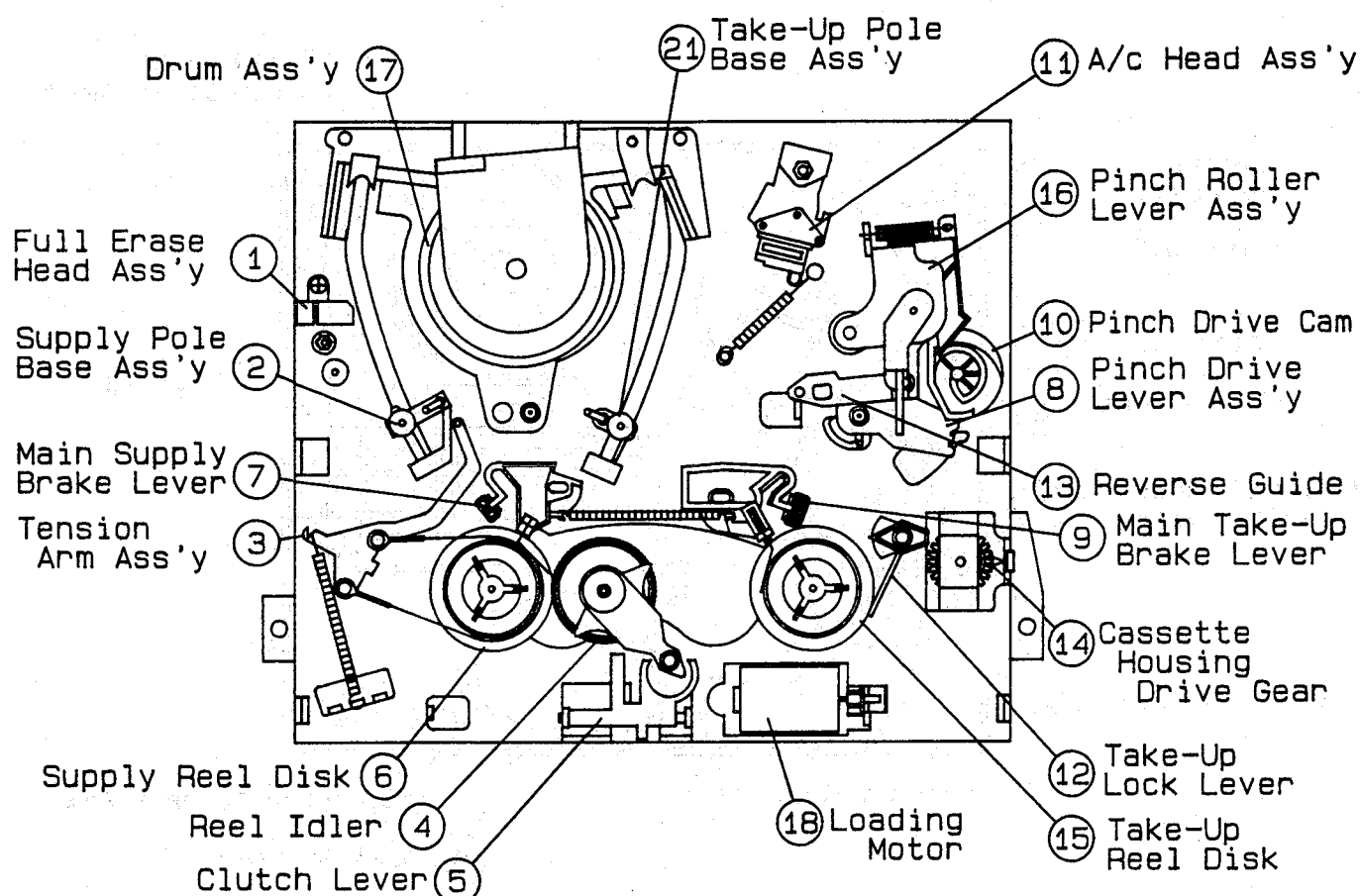
Start and end sensors D804, D803

Record tip switch S812

Take special care of the MC-AE connector (board to board) between the mechanism and main PWB.

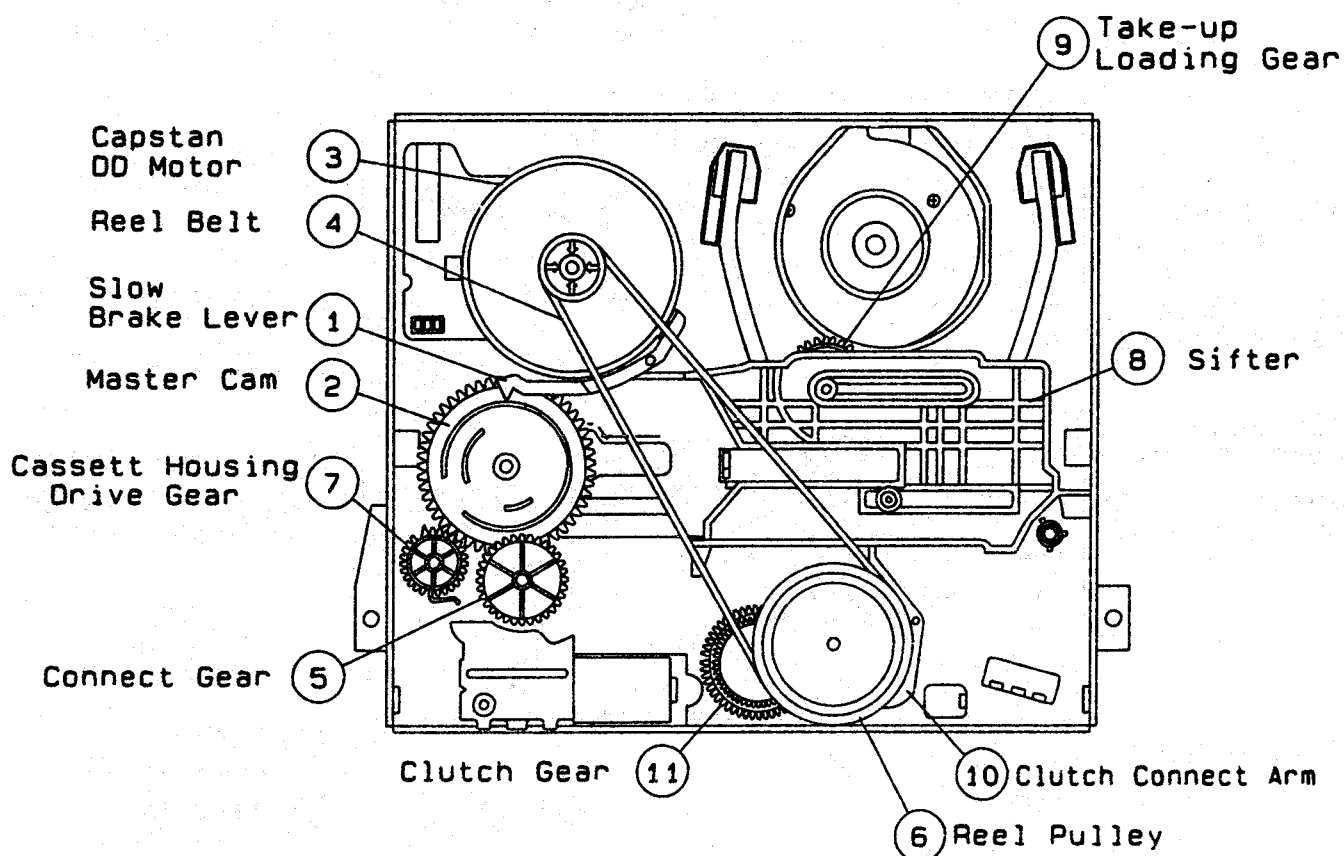


### 3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.	13.	Reverse guide Pulls out the tape and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject the tape.
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.		

## FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	6.	Reel pulley Transmits the power of the capstan D.D. motor to the reel disk via the reel idler.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the reel belt.	8.	Shifter Transmits the operation of the master cam to break and loading gear.
4.	Reel belt Transmits the power to run the tape to the reel pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.








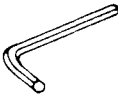

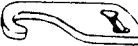
## 4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

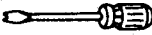

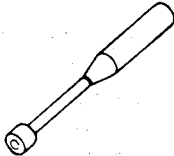

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

### TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-A323U	BX		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VR0CPSV	CK		This tape is especially used for electrical fine adjustment.
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.

**VC-M2E/M7E**  
**VC-M33E/M33DR**

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRIVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
15	Box Driver	JiGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JiGDRIVER110-4	AV		This Jig is used for replacement of the SI roller.
17	Reverse Guide Height Adjusting Jig	JIGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.



**MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION**

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Supply impedance roller (inner hole and shaft)			<input type="checkbox"/>		<input type="checkbox"/>		Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Drum ass'y		<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	Poor S/N ratio, no colour Poor flatness of the envelope with alignment tape	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Sound too small or distorted	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt			<input type="checkbox"/>		<input type="radio"/>	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y					<input type="radio"/>	Cassette not loaded or unloaded	
Loading Motor					<input type="radio"/>		
Reel idler ass'y					<input type="radio"/>	No tape running	
Reel pully ass'y			<input type="checkbox"/> <input type="triangle"/>		<input type="checkbox"/> <input type="radio"/>		
Clutch gear ass'y					<input type="radio"/>		
Main supply/take-up brake levers					<input type="radio"/>	Tape slack	

**NOTE:** ☐: Part replacement.  
☐: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).  
: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

## REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

### ● Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
  - a) Remove the cassette housing installation screws ① and ②.
  - b) Slide and pull out the cassette housing control assembly upward.

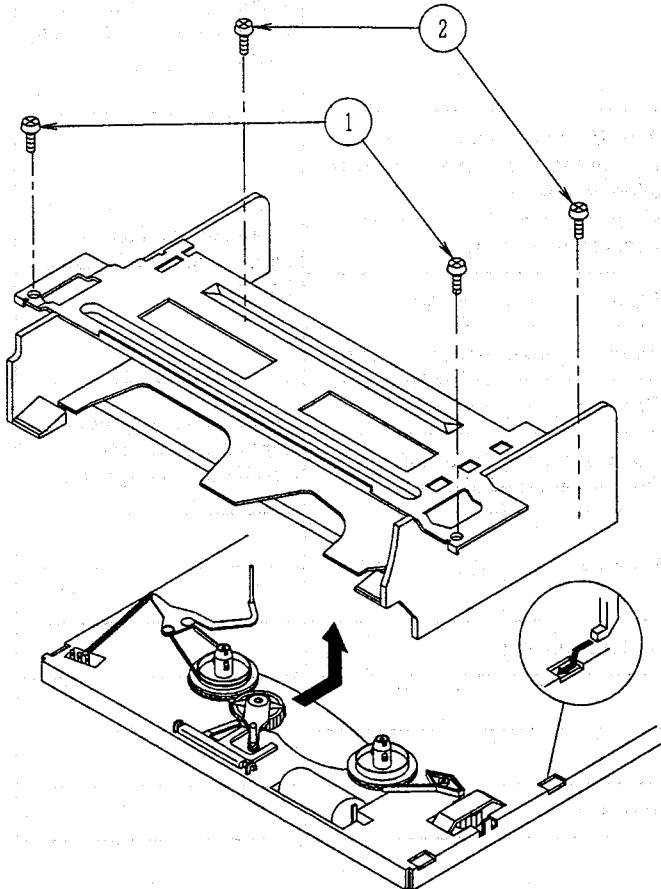


Figure 4-1.

### ● Reassembly

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Plug in the power cord. The cassette control drive gear starts and stops just when a tally mark appears in the mechanism chassis window. Align this tally mark with the cassette control drive angle's mark, as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.

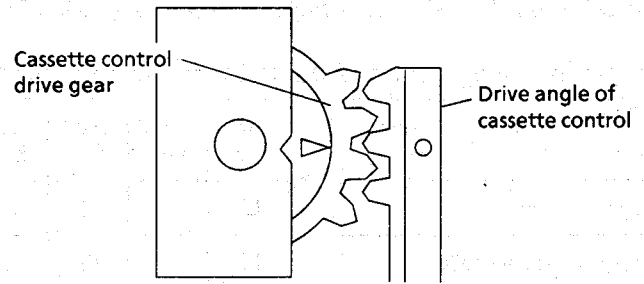


Figure 4-2.

2. Follow the procedures for removal in the reverse order.

### Notes:

- ① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.
- ② In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.
- ③ Load the cassette once onto the cassette housing control assembly after reassembly.

## TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor, before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism chassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

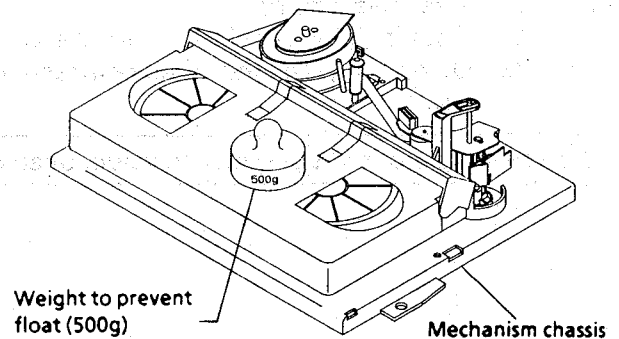


Figure 4-3.

### Note:

The weight should not be more than 500g.

## REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

### ● Removal (Supply and Take-up reel disks)

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Remove the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.

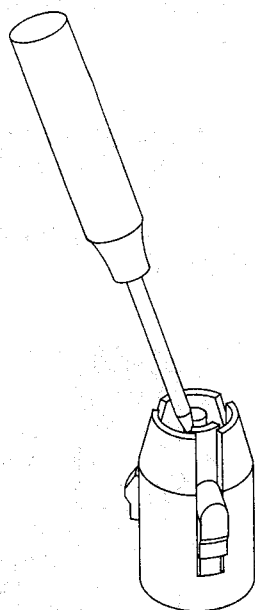
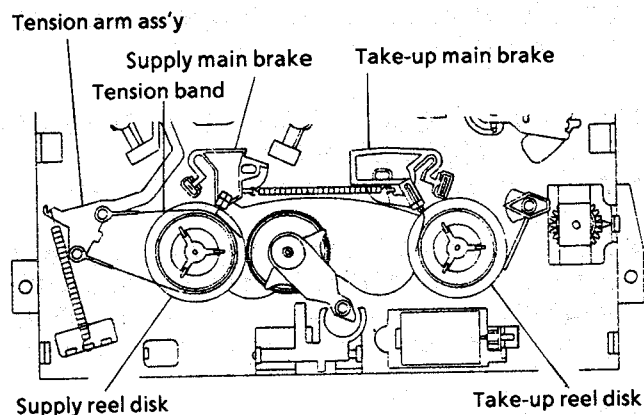


Figure 4-4.

### Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.



Figure 4-5.

### ● Reassembly (Supply reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Install a new supply reel disk onto the shaft.
3. Replace the tension band around the supply reel disk, and insert it to the hole of the tension arm.
4. Check the reel disk height and reassemble the supply main brake.

### Notes:

- ① Take enough care not to deform the tension band during installation of the supply reel disk.
- ② Be careful not to damage the supply main brake.

### ● Reassembly (Take-up reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

### Note:

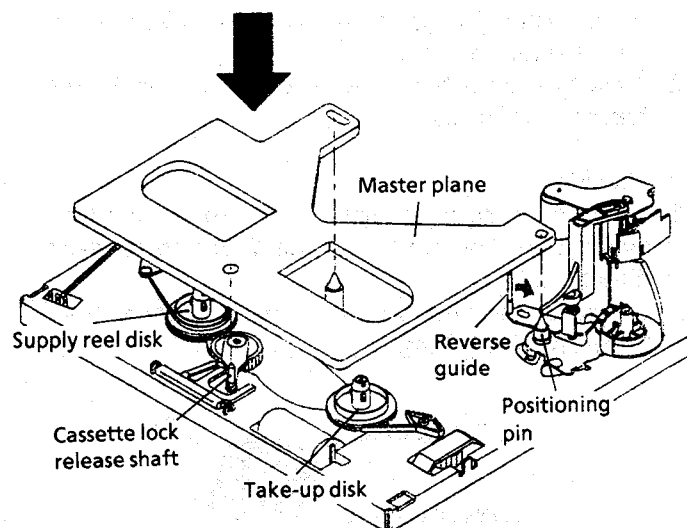
Take care not to damage the take-up main brake.

\* After reassembly, check the video search rewind back tension (see page 18), and check the brake torque (see page 21).

### ● Height checking and adjustment

#### Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).



Set the master plane releasing the reverse guide by a finger.

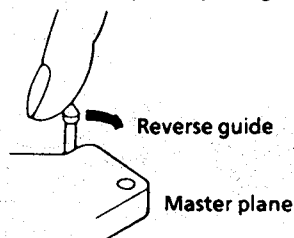


Figure 4-6.

VC-M2E/M7E  
VC-M33E/M33DR

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

**Note:**

Whenever replacing the reel disk, perform the height checking and adjustment.

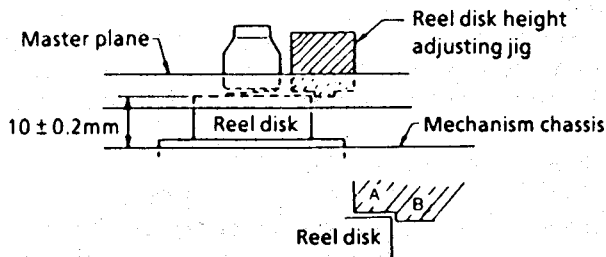


Figure 4-7.

### CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- **Setting**
  1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
  2. Press the FF button to set the mechanism to the fast forward mode.
- **Checking**
  1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
  2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

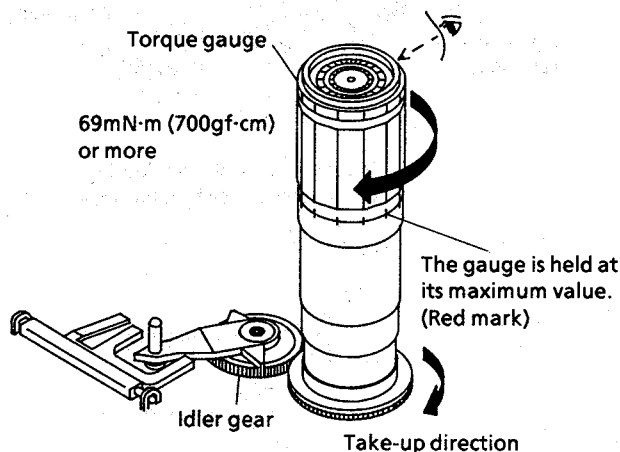


Figure 4-8.

### • Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

**Notes:**

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

### CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- **Setting**
  1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
  2. Press the REW button to set the mechanism to the rewind mode.
- **Checking**
  1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
  2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

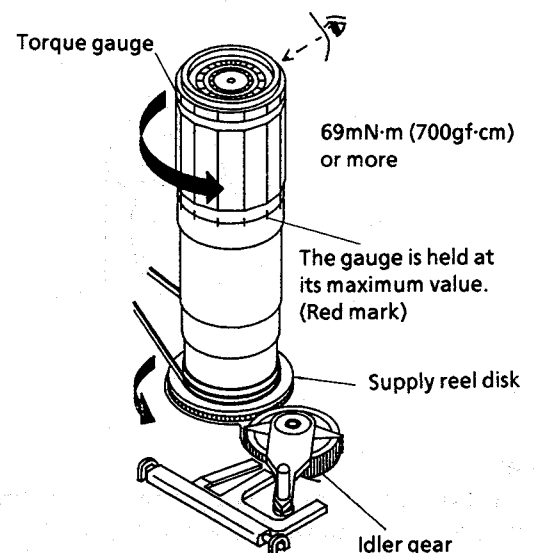


Figure 4-9.

- **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

**Notes:**

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

### CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.
5. Put the weight (500g) on the cassette torque meter.
6. Press the REC button to put the unit in REC mode.

Set value SP  $8.8 \pm 3.8 \text{ mN}\cdot\text{m}$  ( $90 \pm 39 \text{ gf}\cdot\text{cm}$ )

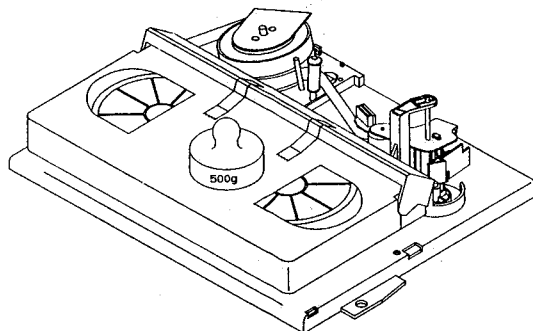


Figure 4-10.

- **Checking**

1. Check that the torque is in the range of  $8.8 \pm 3.8 \text{ mN}\cdot\text{m}$  ( $90 \pm 39 \text{ gf}\cdot\text{cm}$ ).
2. The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation as the value.
3. Place the ass'y in the SP record mode, and check that the take-up torque is within the range.

- **Adjustment**

If the take-up torque in the playback mode is outside the range, replace the reel pulley ass'y.

**Note:**

Stabilize the cassette torque meter to prevent floating.

### CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the REW button to place the ass'y in the video search rewind mode.

- **Checking**

1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value  $14.5 \pm \frac{8}{6} \text{ mN}\cdot\text{m}$  ( $148 \pm \frac{80}{60} \text{ gf}\cdot\text{cm}$ )

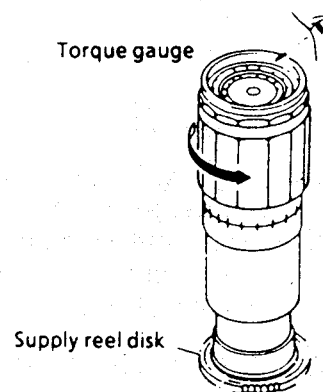


Figure 4-11.

**Note:**

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

- **Adjustment**

If the take-up torque in video search rewind mode is outside the range, replace the reel pulley ass'y.

**Note:**

The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation at the value.

## CHECKING THE FAST FORWARD BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
  1. Push the FF button to place the ass'y in the fast forward mode.
  2. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is  $1.5 \pm 0.9 \text{ mN}\cdot\text{m}$  ( $15 \pm 9 \text{ gf}\cdot\text{cm}$ ).

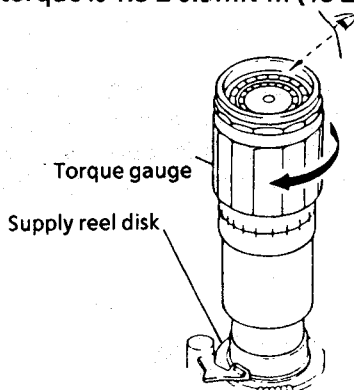


Figure 4-12.

### Note:

- ① Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight exerted on the reel disk.

## CHECKING THE REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
  1. Push the REW button to place the ass'y in the rewind mode.
  2. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is  $1.3 \pm 0.8 \text{ mN}\cdot\text{m}$  ( $13 \pm 8 \text{ gf}\cdot\text{cm}$ ).

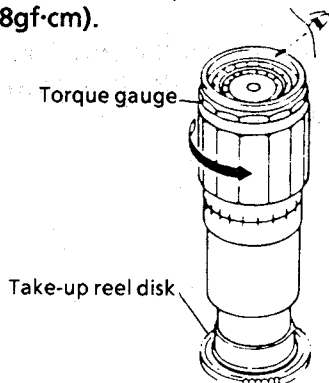


Figure 4-13.

### Note:

- ① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight exerted on the reel disk.

## CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
  1. Push the PLAY button to place the ass'y in the playback mode.
  2. Push the rewind button to place the ass'y in the video search rewind mode.
  3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value  $4 \pm 1.7 \text{ mN}\cdot\text{m}$  ( $41 \pm 17 \text{ gf}\cdot\text{cm}$ ).

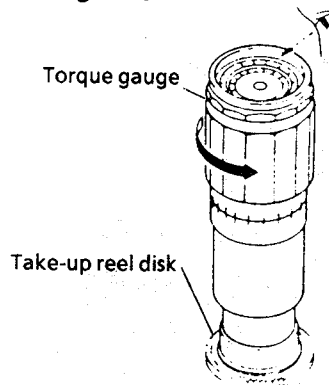


Figure 4-14.

### Note:

- ① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight not exerted on the reel disk.

## CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
 

Push the PLAY button to place the ass'y in the playback mode.

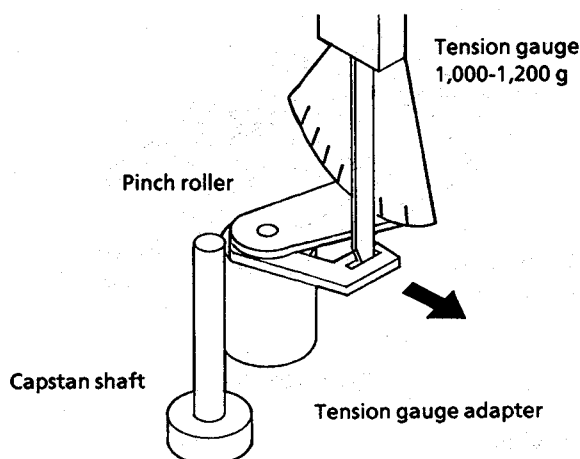


Figure 4-15.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

## CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Setting
  1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
  2. Load the cassette tape into the unit.
  3. Put the weight (500g) on the cassette tape.

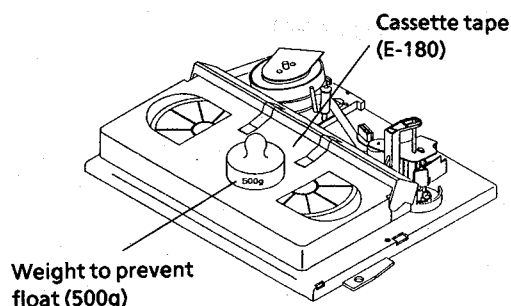


Figure 4-16.

- Checking
  1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.

2. Visually check to see if the left end of the tension pole is in alignment with the line 0.2 mm left of the center line of the SI roller. Readjust as required in the following steps.

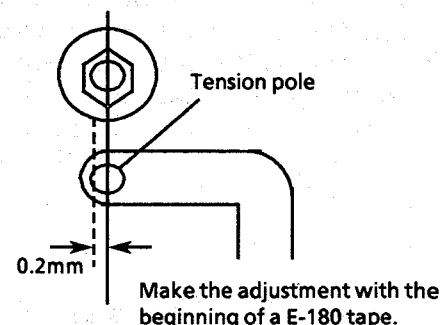


Figure 4-17.

- ① If the end is at the left from the dotted line:

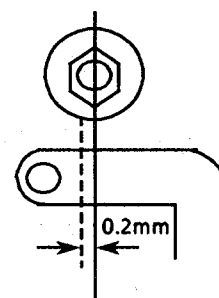


Figure 4-18.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam and turn it clockwise.
2. Place the cassette in position and check the tension pole position.

- ② If the end is at the right from the dotted line:

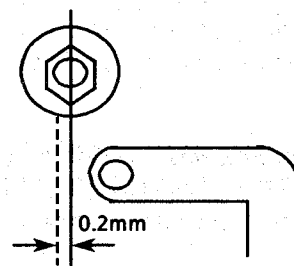


Figure 4-19.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam to turn it counterclockwise.
2. Place the cassette in position and check the tension pole position.

**Note:**

- ① The tension band positioning cam cannot be adjusted with a cassette in place because the cam will be located below the cassette. Repeat a series of steps; empty loading, adjustment, cassette placement and position checking.
- ② Turn the positioning cam clockwise to move the tension pole to the right (in the black-arrow direction). Turn it counterclockwise to move the tension pole to the left (in the white-arrow direction).

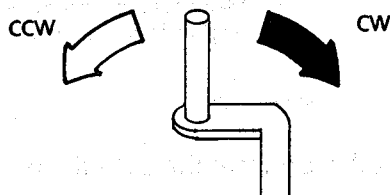


Figure 4-20.

- ③ Adjustable range of the tension pole positioning cam.

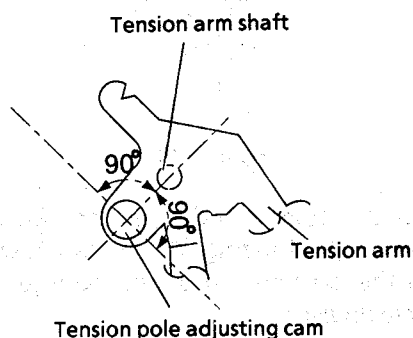


Figure 4-21.

Adjust the tension pole positioning cam so that the arrow mark on the cam be within 90° left and right from the tension arm shaft's center.

## CHECKING AND ADJUSTMENT OF RECORD / PLAYBACK BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Setting
  1. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
  2. Load the cassette torque meter into the unit.
  3. Put the weight (500g) on the cassette torque meter.

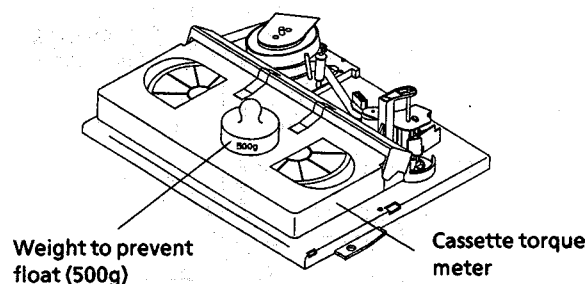


Figure 4-22.

### ● Checking

1. Push the REC button to place the unit in the record mode.
2. Check that the back tension indicated by the gauge is within the set range 31 to 38 g·cm.

### Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

### ● Adjustment

1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

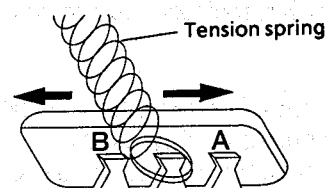


Figure 4-23.



## CHECKING THE BRAKE TORQUE

### ● Checking the brake torque at the supply side

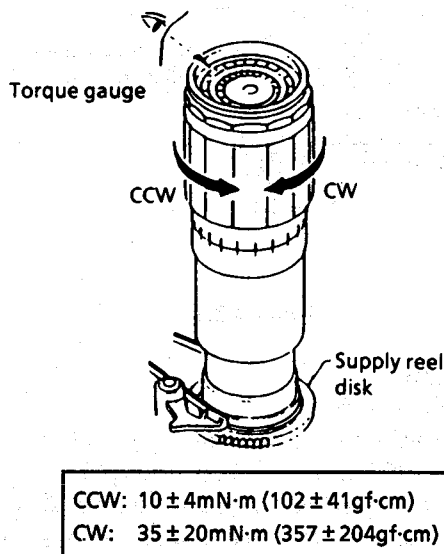


Figure 4-24.

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.

#### ● Setting

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

#### ● Checking

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction =  $35 \pm 20 \text{ mN}\cdot\text{m}$  ( $357 \pm 204 \text{ gf}\cdot\text{cm}$ ), CCW direction =  $10 \pm 4 \text{ mN}\cdot\text{m}$  ( $102 \pm 41 \text{ gf}\cdot\text{cm}$ ), and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

### ● Checking the brake torque at the take-up side

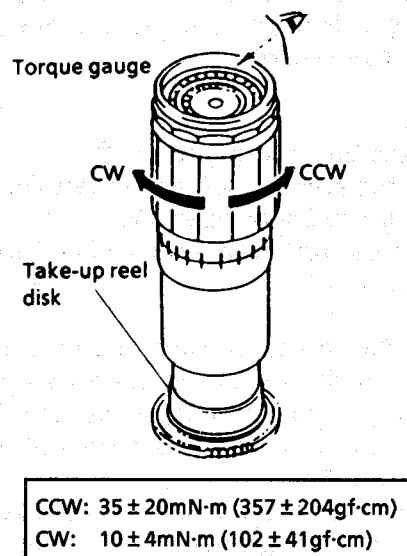


Figure 4-25.

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.

#### ● Setting

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

#### ● Checking

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction =  $35 \pm 20 \text{ mN}\cdot\text{m}$  ( $357 \pm 204 \text{ gf}\cdot\text{cm}$ ), CW direction =  $10 \pm 4 \text{ mN}\cdot\text{m}$  ( $102 \pm 41 \text{ gf}\cdot\text{cm}$ ), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

### ● Adjustment of the brake torque at the supply side and the take-up side

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y or the main brake spring.

#### Note:

When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 15), and the brake torque checking.

## REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

### ● Removal

1. Loosen the tilt adjusting screw ①.
2. Remove the azimuth adjusting screw ②.
3. Remove the A/C head screw ③.
4. Unsolder the A/C head PWB soldered to the A/C head assembly.

### Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 24). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

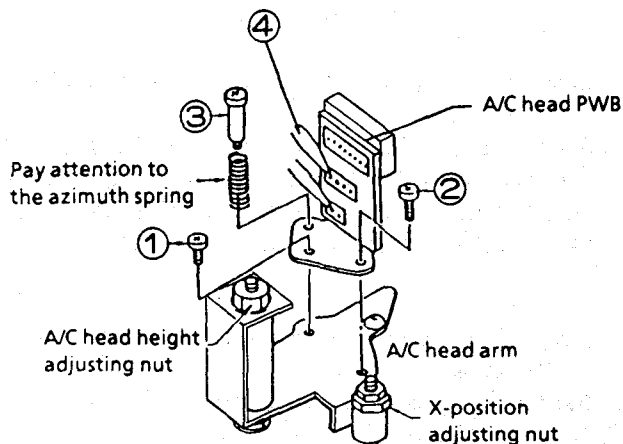


Figure 4-26.

### ● Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

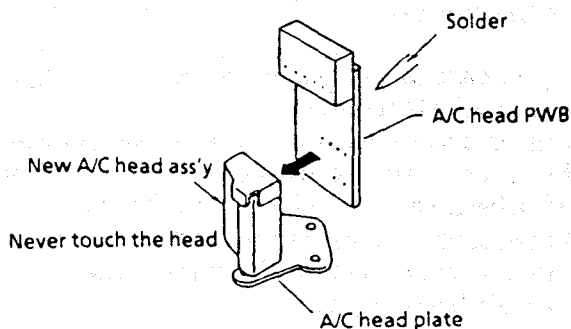


Figure 4-27.

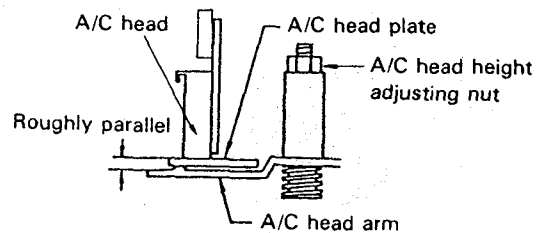
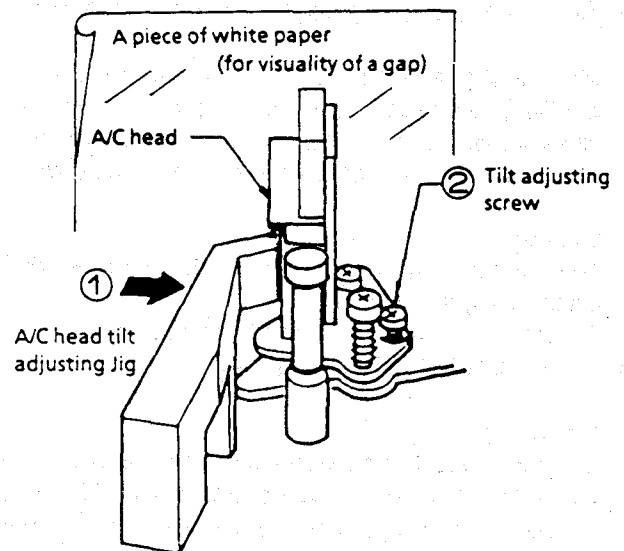


Figure 4-28.

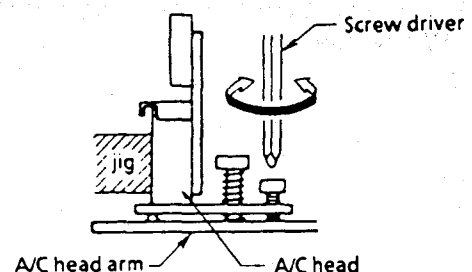
### ● Adjustment

#### [A/C head tilt angle]

1. Set the mechanism to the loading mode.
2. Place the A/C head tilt adjusting Jig ①.
3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the Jig and the A/C head.



(a)

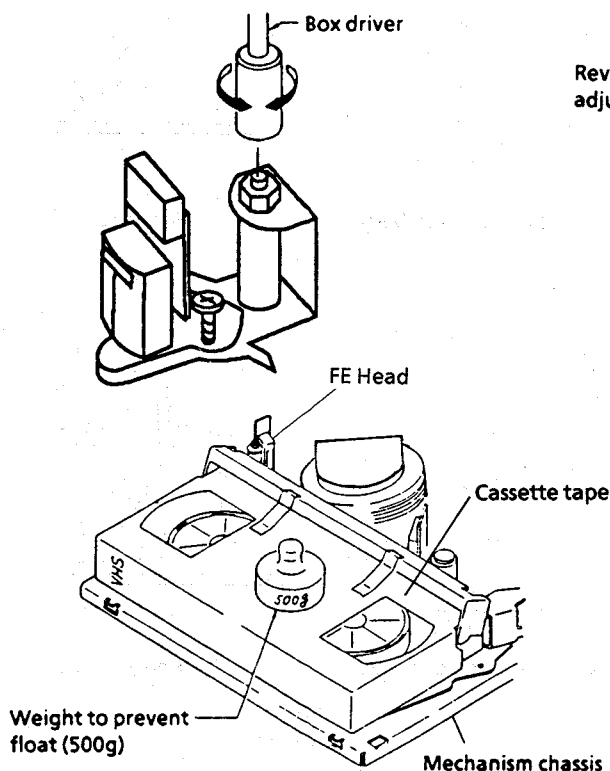


(b)

Figure 4-29.

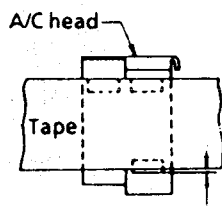
## [A/C head height rough adjustment]

### ● Setting



- ① Roughly adjust the height of the A/C head by turning the A/C head adjusting hexagon nut with the specialized box driver until the tape is in the position shown below.
- ② Set the cassette tape to the mechanism chassis.
- ③ Press the PLAY button to put the unit in the playback mode.

### ● Adjustment



Adjust the nut visually so that the control head is visible 0.3 to 0.5mm below the bottom of the tape.

Figure 4-30.

## HEIGHT ADJUSTMENT OF REVERSE GUIDE

### [Height adjustment of reverse guide]

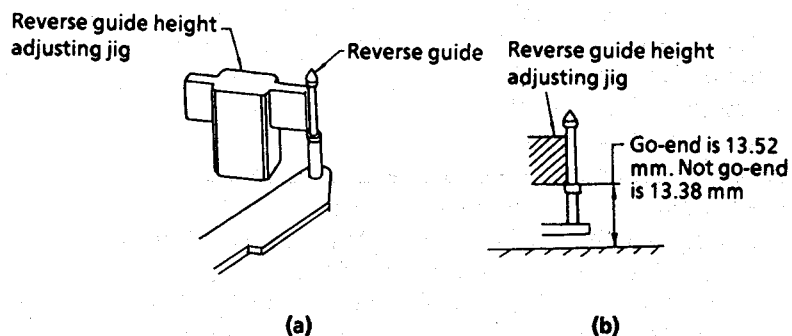


Figure 4-31.

1. In the tape load mode, make adjustment at the 13.38mm side first and then rotate the height adjusting nut by 1/6 turn counterclockwise.
2. Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
3. Use a commercially available box driver to turn the height adjusting nut.

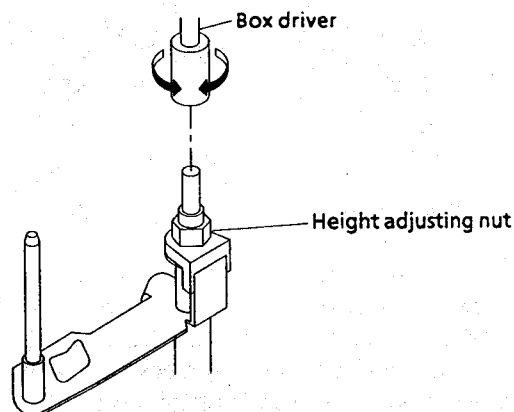


Figure 4-32.

## ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
3. Check and adjust the position of the tension pole. (See page 19.)
4. Check and adjust the video search rewind back tension. (See page 18.)
5. Set the tilt angle of the A/C head. (See page 22.)
6. Rough adjustment of tape drive train.
  - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP203). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP201).
  - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-33.)
  - c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode.  
(Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)

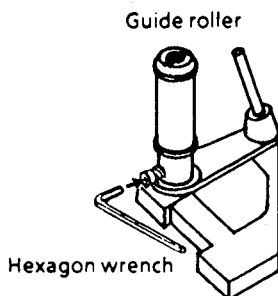


Figure 4-33.

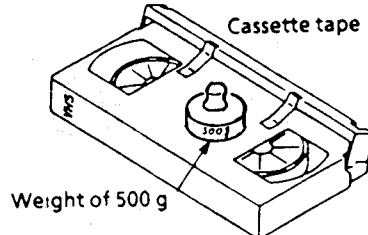


Figure 4-34.

- d) In the X value adjustment mode (see the Electrical Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
- f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
  - 1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Figure 4-35 (a).
  - 2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Figure 4-35 (b).

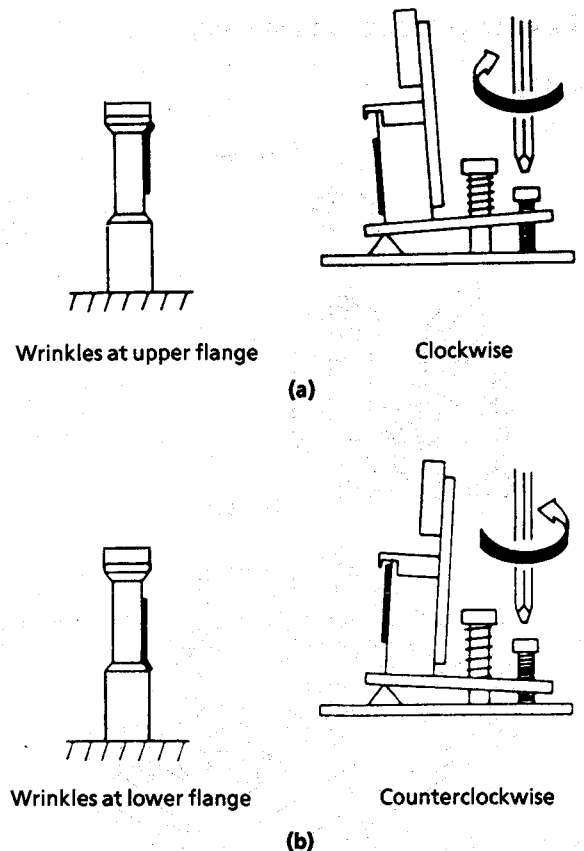


Figure 4-35.

### Notes:

1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelop becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

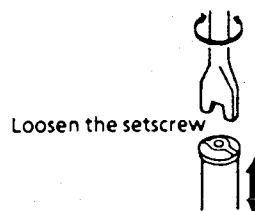


Figure 4-36.

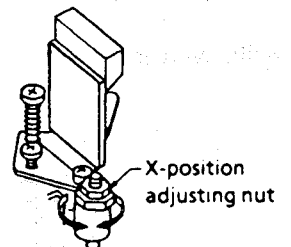


Figure 4-37.

PB CHROMA envelope (TP203)

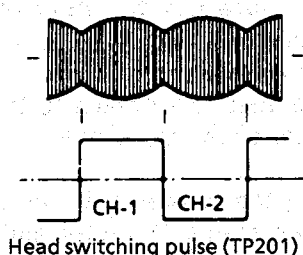


Figure 4-38.

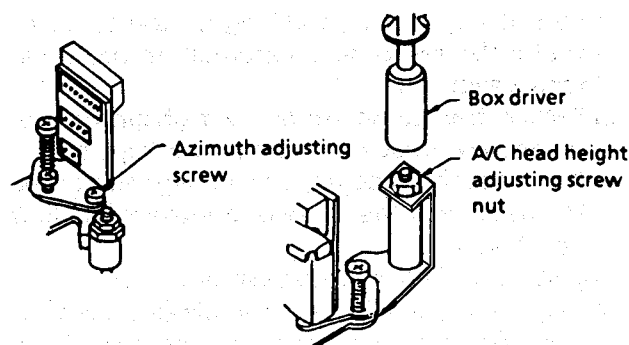


Figure 4-39.

Figure 4-40.

## 7. Adjustment of A/C head height and azimuth

- Connect an oscilloscope to the audio output terminal.
- Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 4-39.)
- Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
- Perform the adjustment in b) again.
- After this adjustment, apply glyptal to the screws and nuts to fix them.

## 8. Adjustment of tape drive train and X-Position.

- Connect the oscilloscope to the test points (TP203) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP201).
- Play back the tape drive train alignment tape.
- Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelop waveform that is as flat as possible.
- If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-41.
- Adjust for maximum flatness of the envelope as the step 6, e) in page 24.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-41.

VC-M2E/M7E  
VC-M33E/M33DR

- f) Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
  - g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
  - h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.
9. Adjustment of A/C head X-position.
- a) In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor, to center the tracking.
  - b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
  - c) Adjust the playback switching point.
  - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

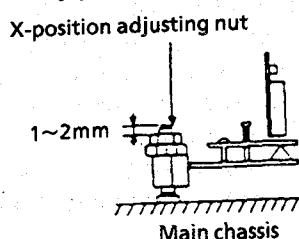


Figure 4-42.

## REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
  - Removal (Follow the order of indicated numbers.)
1. Disconnect from the board-to-board connector on the main PWB.
  2. Remove the reel belt ①.
  3. Remove the screws ②.

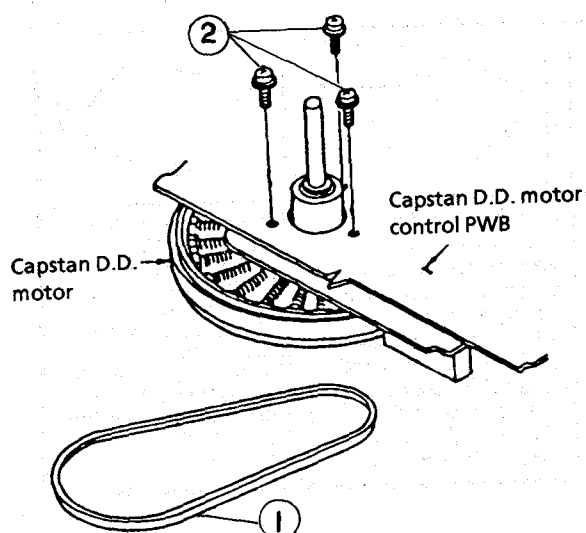


Figure 4-43.

## ● Reassembly

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Attach the reel belt. Reconnect to the board-to-board connector on the main PWB.

## Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check the servo circuit.

# **ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.**

1. Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

## **1. Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).**

Place the following parts in position in numerical order.

- (1) Pinch drive cam ①
- (2) Pinch roller and pinch double-action lever ②
- (3) Open lever ③

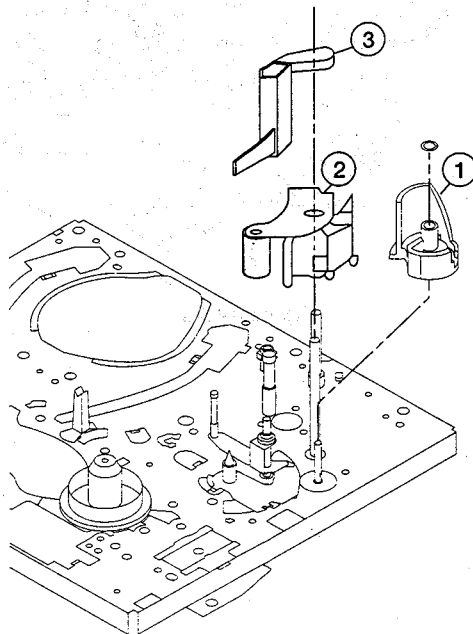


Figure 4-44.

## **① Insert Pinch Drive Cam.**

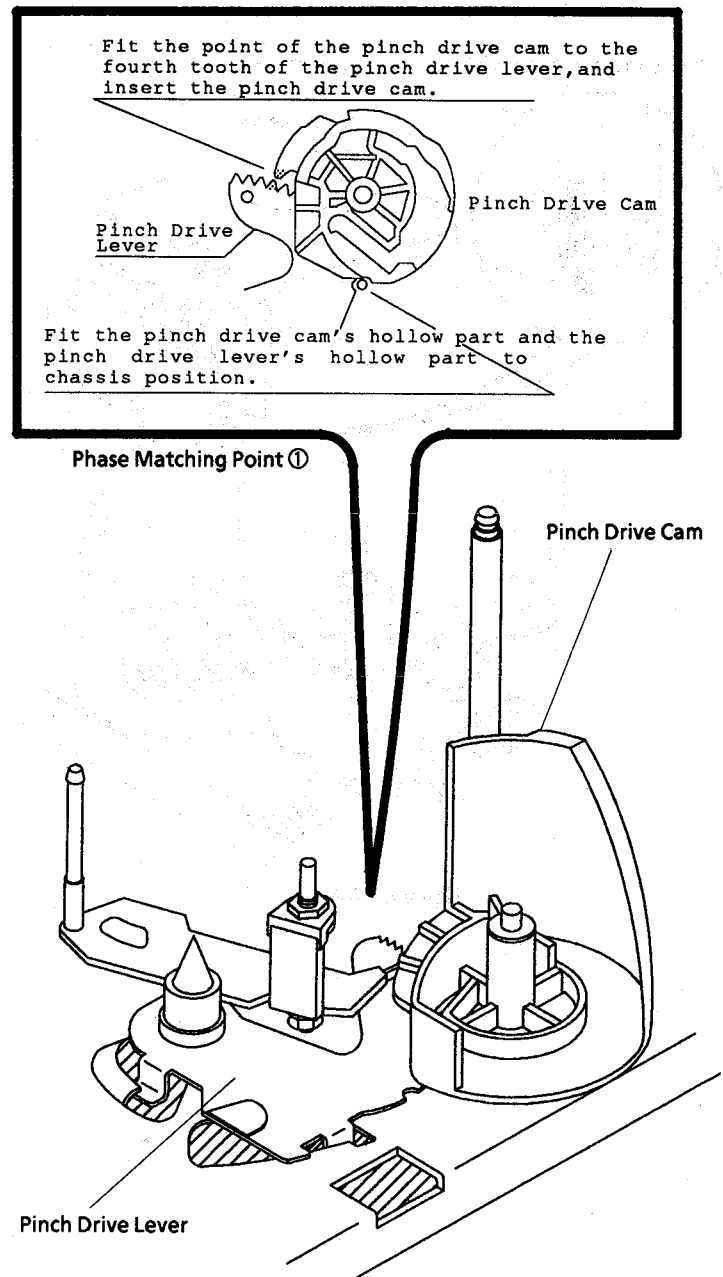
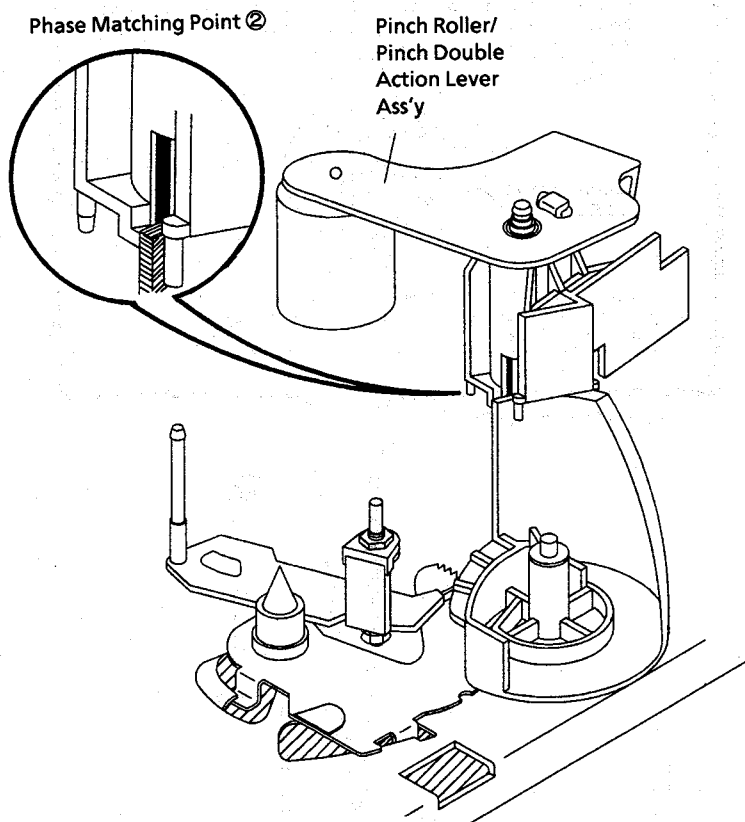


Figure 4-45-1.

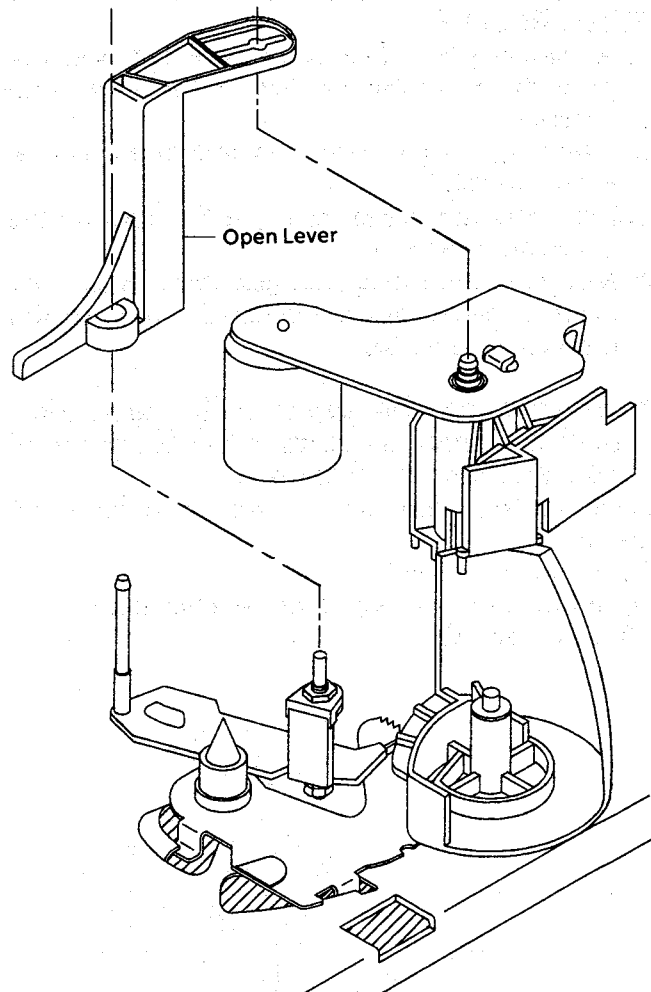
**VC-M2E/M7E  
VC-M33E/M33DR**

- ② Insert Pinch Roller/Pinch Double Action Lever Ass'y.



**Figure 4-45-2.**

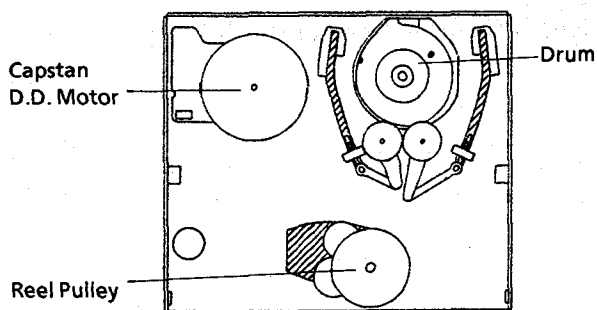
- ③ Insert Open Lever.



**Figure 4-45-3.**



## 2. Mounting the shifter (on the back of the mechanism chassis).



(Bottom Side of mechanism chassis)

Figure 4-46.

1. Make sure that the loading gear is at the point (1) as shown below.
2. Place the shifter in position, keeping in mind the 7 insertion points and the five relief points.
3. For the phase matching at the insertion point (1), see the point (2) as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ⑥.

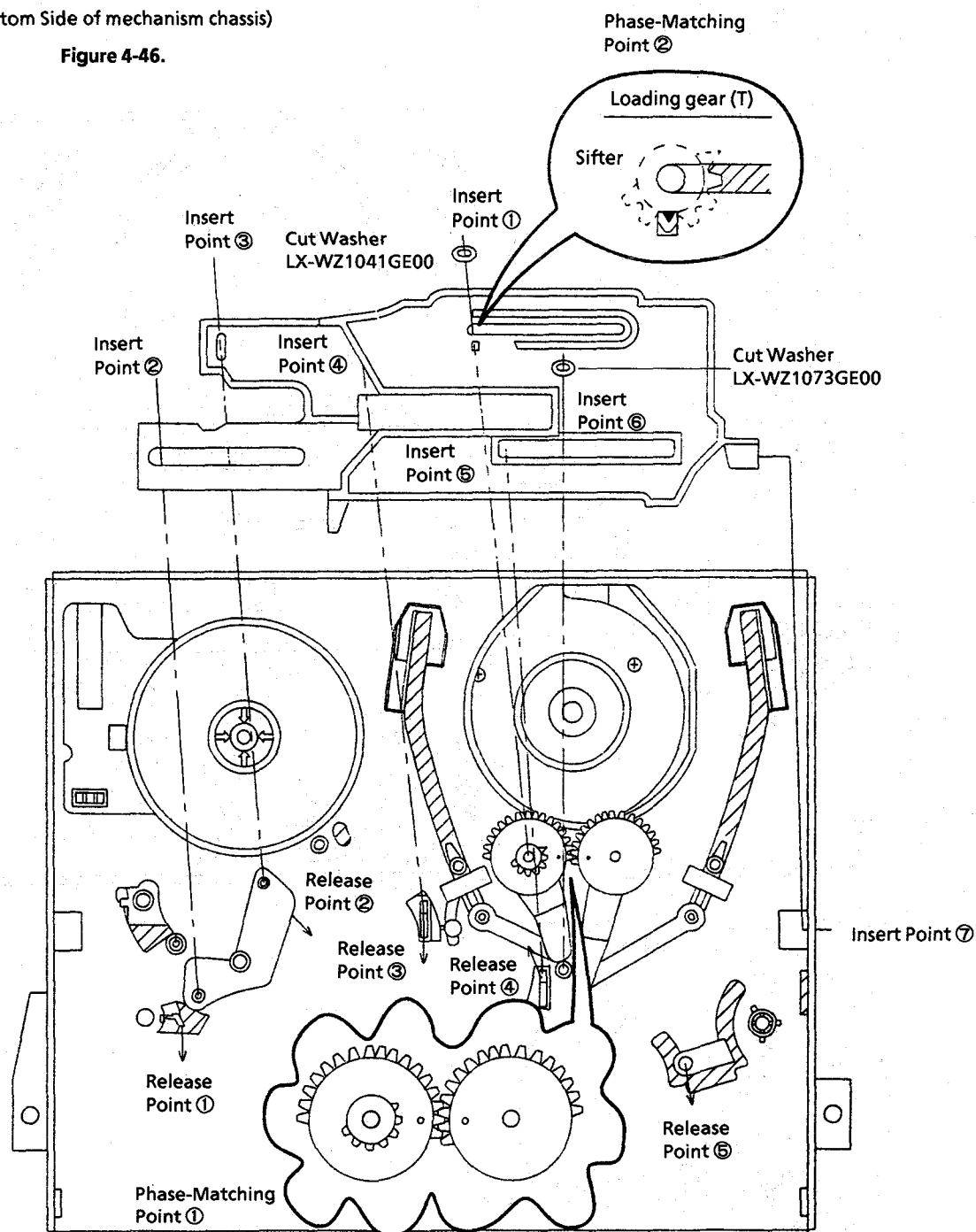


Figure 4-47.

### 3. Mounting the master cam (on the back of the mechanism chassis).

- (1) Make sure beforehand that the shifter is at the point as shown below.
- (2) Place the master cam in the position as shown below.

#### Note:

See the figure below for the phase matching between the master cam and the cassette control drive gear.

- (3) Finally fix the master cam with E ring.

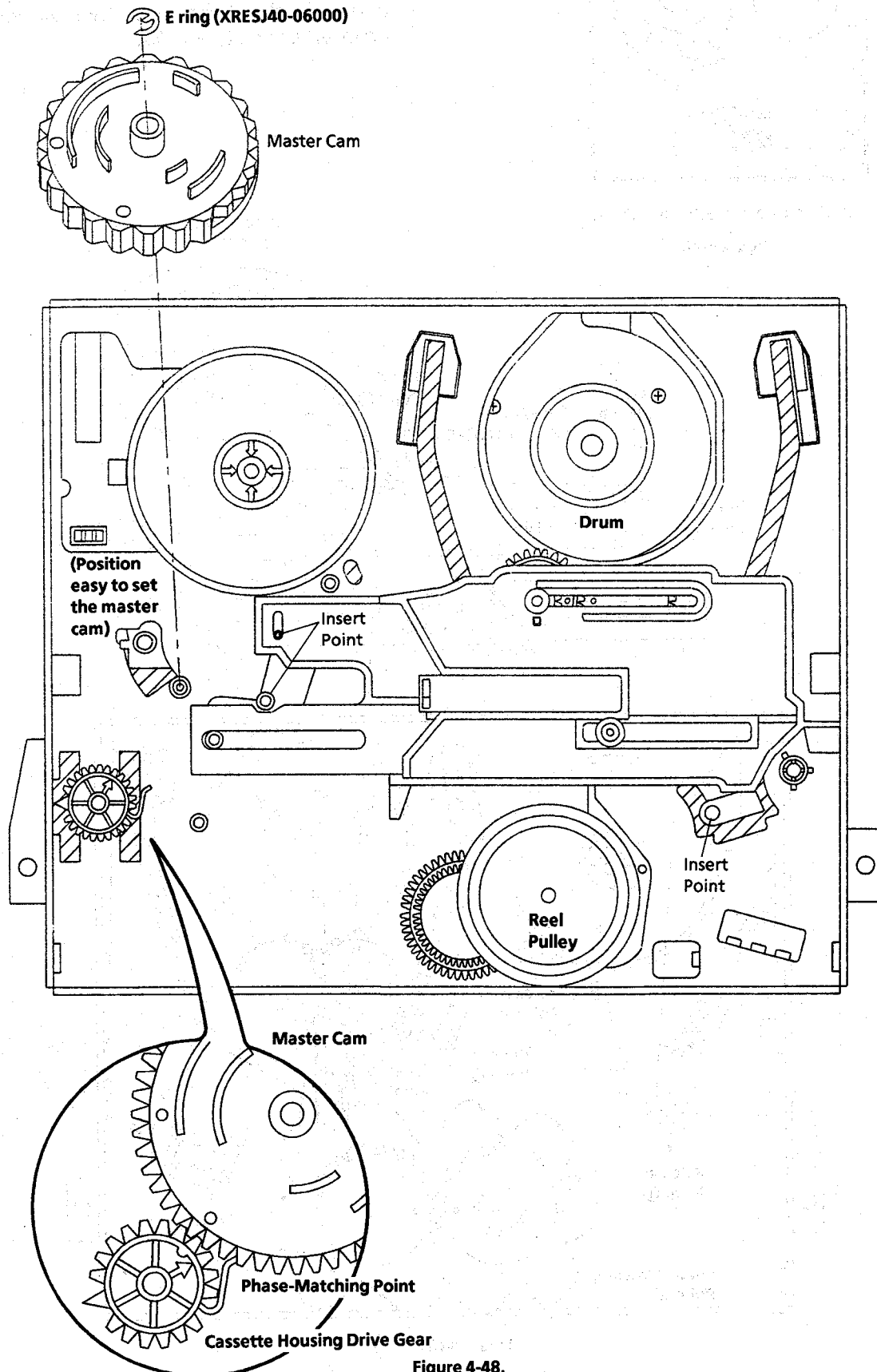


Figure 4-48.

#### 4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

- (1) Assemble the connect gear.
- (2) Assemble the slow brake.
- (3) Assemble the loading motor unit.

#### Note:

Let the slow brake leg out of the front of the mechanism chassis. Catch the spring to the take-up fixing guide that is at the left of the A/C head.

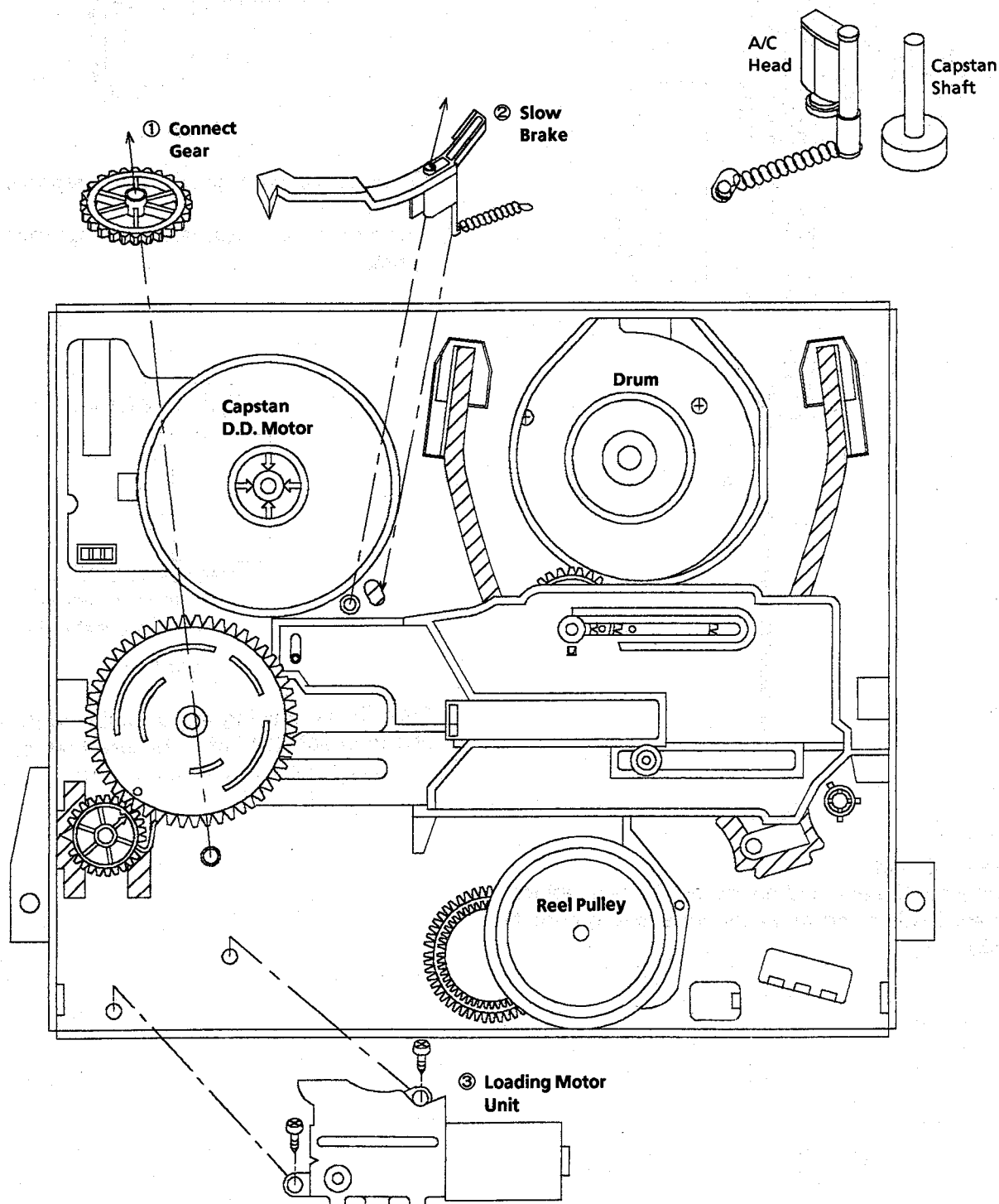


Figure 4-49.

#### Note:

Before setting up the loading motor, make sure the phase is matched. To do so, turn the connection gear clockwise and check to see if the loading is complete and if the pinch roller comes into contact.

When these actions are made smoothly, return the mechanism to the state as shown above. Finally mount the loading motor unit.

## REPLACEMENT OF LOADING MOTOR

### ● Removal

Remove 2 screws.

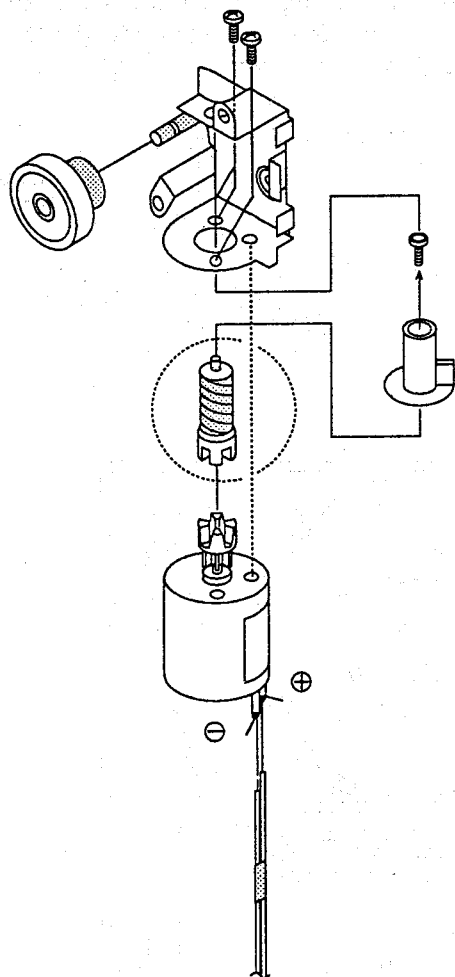


Figure 4-50.

### ● Replacement

- ① Take out the old loading motor. Place a replacement loading motor as shown above (figure 4-50.).

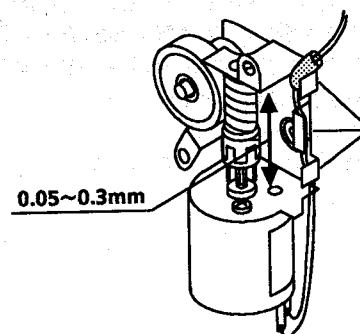


Figure 4-51.

- ② Adjust the worm gear's thrust gap to 0.05 to 0.3 mm.  
Use the specific washers for an appropriate thickness.

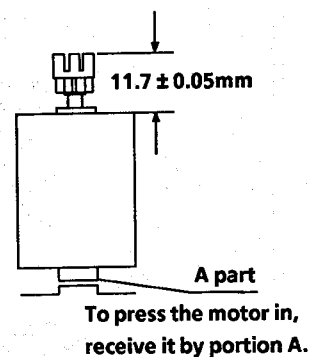
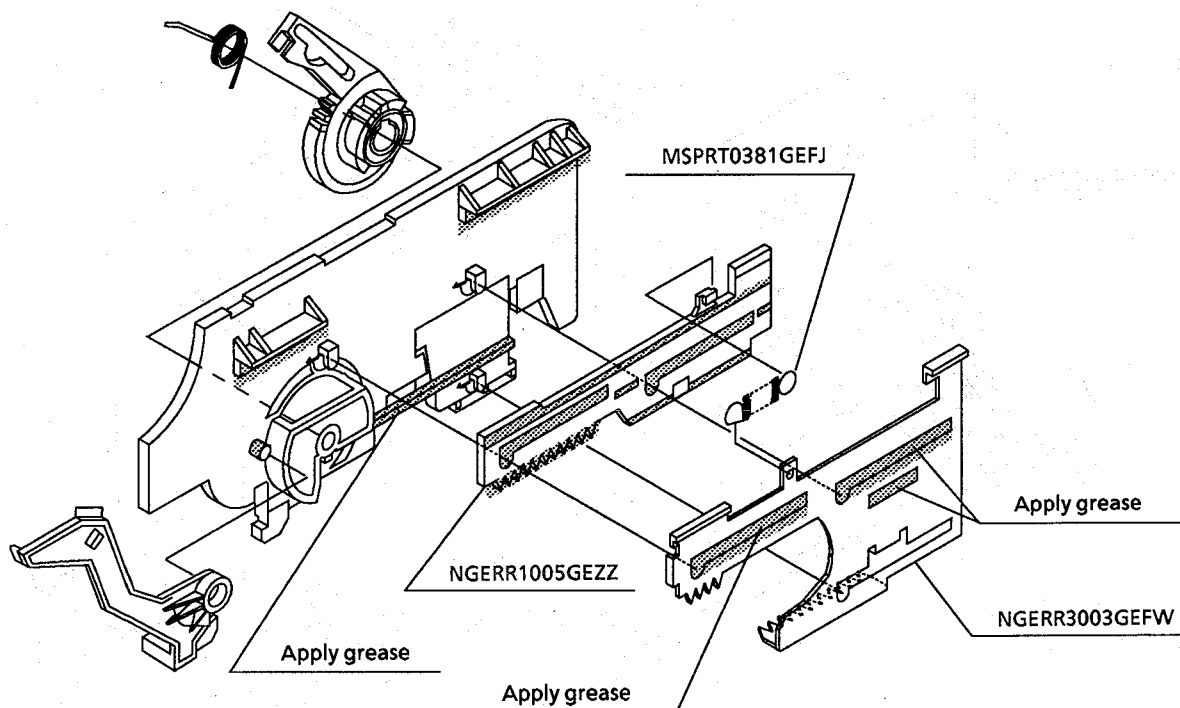


Figure 4-52.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is  $11.7 \pm 0.05$  mm away from the motor.

## ASSEMBLY OF CASSETTE HOUSING

### ① Drive Gear R and Drive Angle Ass'y



#### Phase Matching Point

- Fix the drive angle ass'y to the drive gear R as shown in the figure.

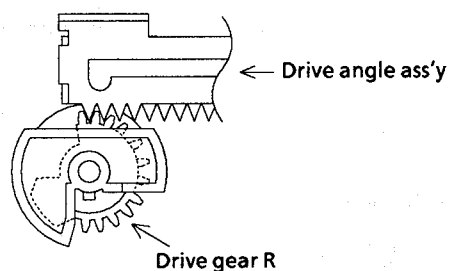


Figure 4-53.

② Synchro Gear, Drive Gear L and Drive Gear R

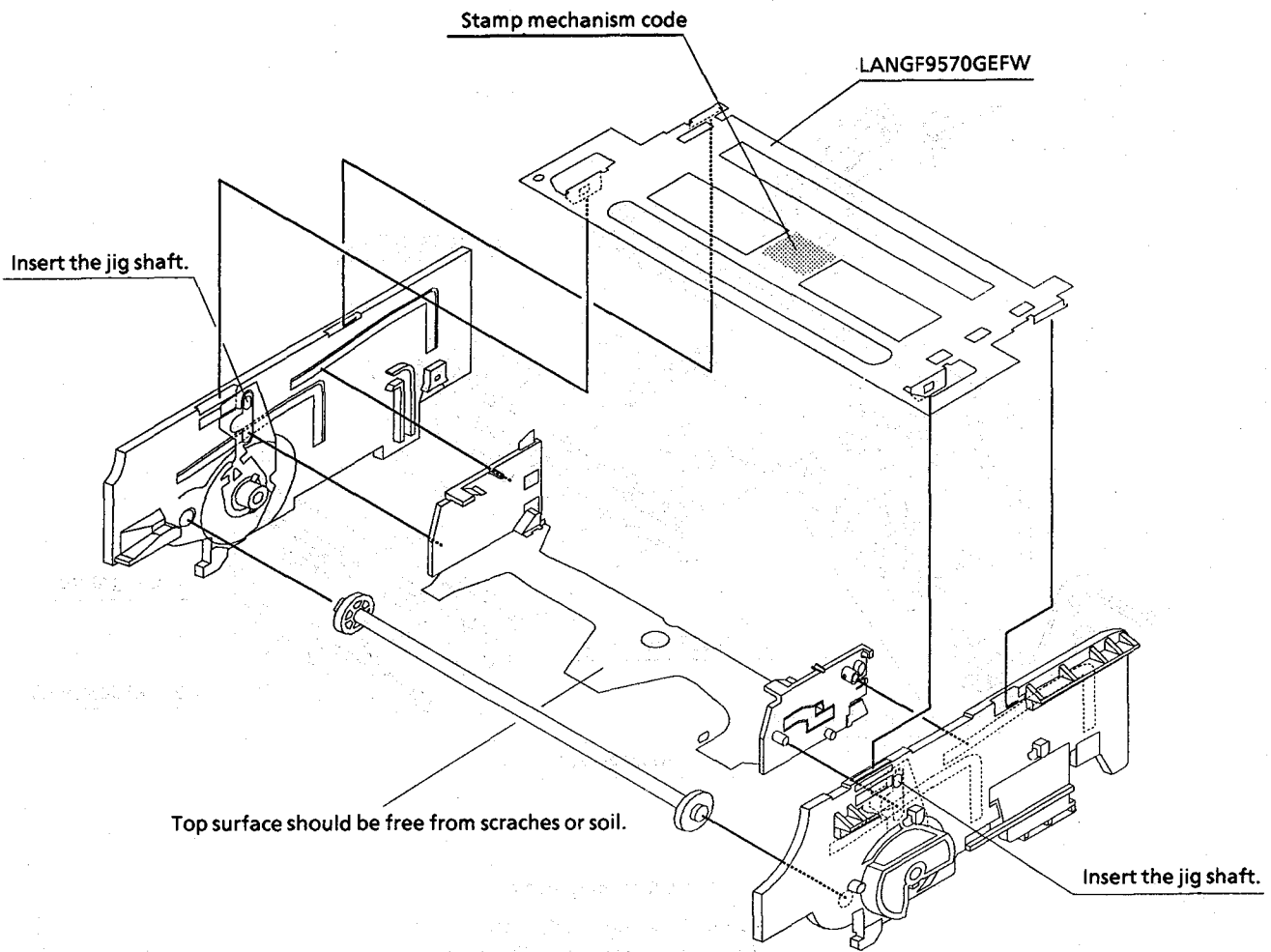


Figure 4-54.

Align the drive gear's round hole with the synchro gear's triangular ( $\triangle$ ) symbol. Do this alignment for both the drive gears.

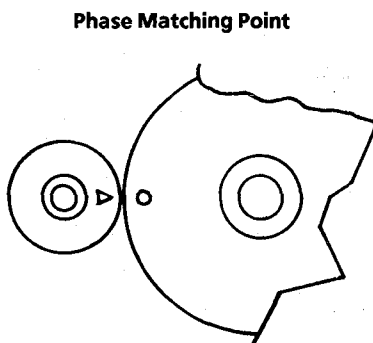


Figure 4-55.

**Note:**

Do not over-turn both of the drive gears when the phase has been matched. These gears are partially toothless and might come out of mesh with the synchro gear. In such a case, the phase needs re-matching.

## 5. ELECTRICAL ADJUSTMENT

### Notes:

- Before the adjustment:  
Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.  
Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>⊙ Colour TV monitor</li> <li>⊙ Audio signal generator</li> <li>⊙ DC voltmeter</li> <li>⊙ Blank video cassette tape</li> <li>⊙ Screwdriver for adjustment</li> <li>⊙ Colour bar signal generator</li> <li>⊙ Frequency counter</li> </ul> | <ul style="list-style-type: none"> <li>⊙ Dual-trace oscilloscope</li> <li>⊙ AC milli-voltmeter</li> <li>⊙ Alignment tape (VROCP5V)</li> <li>⊙ Alignment tape (VROAT5V)</li> </ul> |
|--|---|

### ※ Servicing precautions

When the IC803 (E<sup>2</sup>PROM) has been replaced, make the following reprogramming. Depending on models, the IC803 (E<sup>2</sup>PROM) has been factory-adjusted for it's memory function.

It's therefore necessary to reprogram the memory function for the model in question.

Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

### ● Location of controls and test points

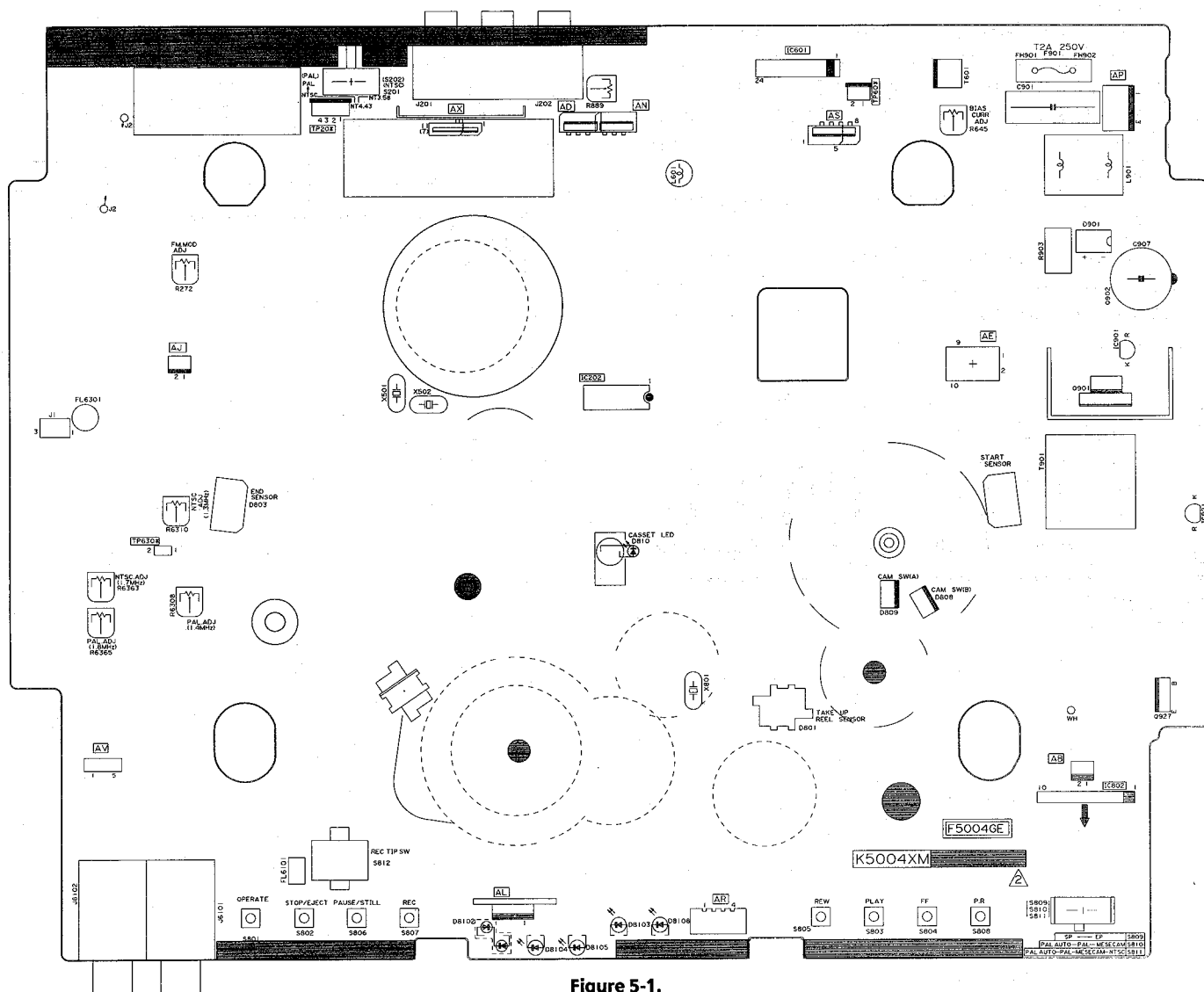


Figure 5-1.

## SERVO CIRCUIT ADJUSTMENT

### ADJUSTMENT OF PAL SYSTEM HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP201 (H. SW. P.) to CH-1 VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	$6.5 \pm 0.5H$ (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)  
(Playback picture on the monitor screen.)
2. Make for a moment short-circuit between pin (3) of IC801 and AT5V line located on the main PWB.  
Be sure that PB LED 4Hz blinks into the TEST mode.
3. Connect a dual-trace oscilloscope to the video output terminal and TP201 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.).
4. Observe the waveform with an oscilloscope and adjust the FF or REW button so that the specification.
5. Press the STOP button in the return to normal mode.
6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 5-2. just after the head switching point have been adjusted.

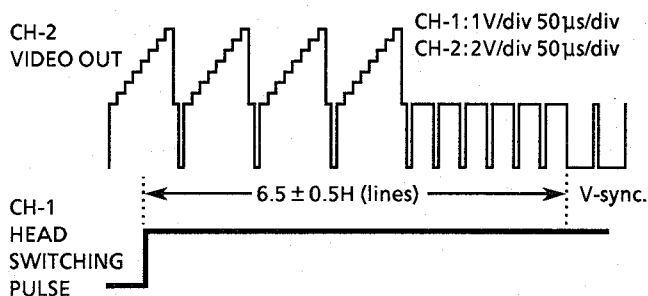


Figure 5-2.

### ADJUSTMENT OF RECORDING PHASE

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Recording
Input signal	EIA colour bar (1.0Vp-p)
Cassette	Self-recorded tape
Test point	TP201 (H. SW. P.) to CH-1 VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Control	R889 Recording phase control
Specification	$7.0 \pm 0.5H$ (lines)

1. Feed a PAL system video signal to the VIDEO IN jack.
2. Set the tape speed in SP mode by using the remote controller and recording mode.
3. Observe the waveform with an oscilloscope and adjust the R889 so that the specification.

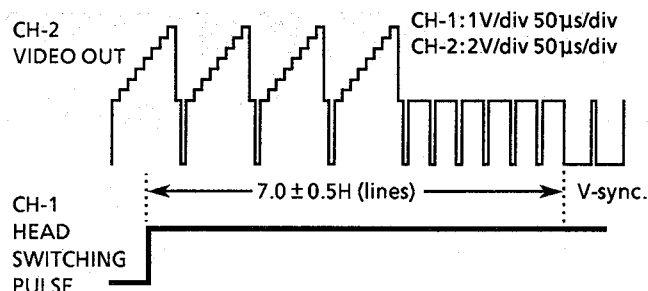


Figure 5-3.



**ADJUSTMENT OF PAL SYSTEM SP SLOW TRACKING PRESET**

Measuring instrument	Colour TV monitor
Mode	Playback (Slow)
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons ( + ) or ( - )
Specification	Minimized noise on monitor screen

1. Feed a PAL system video signal to the VIDEO IN jack.
2. Set the tape speed in SP mode by using the remote controller and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between AT5V line and pin (3) of IC801 on the main PWB.  
Be sure that STILL LED 4Hz blinks into the TEST mode.
6. Look at the monitor screen and adjust the ( + ) or ( - ) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the PB button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.

**Note:**

Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

**ADJUSTMENT OF NTSC SYSTEM SP SLOW TRACKING PRESET (VC-M2E/M33DR)**

Measuring instrument	Colour TV monitor
Mode	Playback (Slow)
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons ( + ) or ( - )
Specification	Minimized noise on monitor screen

1. Playback the alignment tape. (VROATSV)
2. Press the SLOW button on the remote control, and playback the SP portion in the slow mode.
3. Make for a moment short-circuit between AT5V line and pin (3) of IC801 on the main PWB.  
Be sure that STILL LED 4Hz blinks into the TEST mode.
4. Look at the monitor screen and adjust the ( + ) or ( - ) TRACKING buttons so that the there is noise disappears from the screen.
5. Press the PB button to return to normal mode.
6. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.

**ADJUSTMENT OF NTSC SYSTEM SP SLOW TRACKING PRESET (VC-M7E/M33E)**

Measuring instrument	Colour TV monitor
Mode	Playback (Slow)
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons ( + ) or ( - )
Specification	Minimized noise on monitor screen

1. Feed a NTSC system video signal to the VIDEO IN jack.
2. Set the tape speed in SP mode by using the remote controller and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between AT5V line and pin (3) of IC801 on the main PWB.  
Be sure that PB LED 4Hz blinks into the TEST mode.
6. Look at the monitor screen and adjust the ( + ) or ( - ) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the PB button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.

**Note:**

Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

### ADJUSTMENT OF PAL SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons ( + ) or ( - )
Specification	No vertical jitter of the picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust ( + ) or ( - ) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.

**Note:**

Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

### ADJUSTMENT OF NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE (VC-M2E/M33DR)

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons ( + ) or ( - )
Specification	No vertical jitter of picture

1. Playback the alignment tape. (VROATSV)
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust ( + ) or ( - ) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.

### ADJUSTMENT OF NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE (VC-M7E/M33E)

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below)
Control	Tracking control buttons ( + ) or ( - )
Specification	No vertical jitter of the picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust ( + ) or ( - ) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.

**Note:**

Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

## Y/C CIRCUIT ADJUSTMENT

### CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.1\text{Vp-p}$

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0 Vp-p as shown in Figure 5-4.

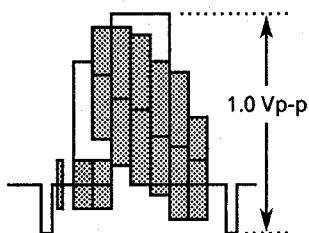


Figure 5-4.

#### Note:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

### CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin (48) of IC201, GND
Specification	$190 \pm 5\%$ (See note below)

1. Connect a oscilloscope to pin (48) of IC201 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 5-5.

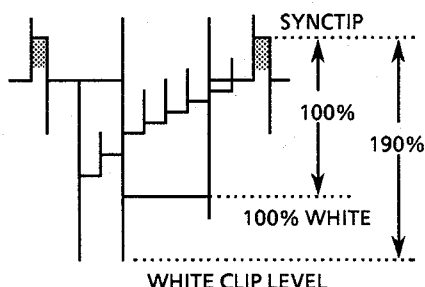


Figure 5-5.

#### Note:

From sync tip to white peak, the level is 100%.  
The white clip level is 90% above the white level.

### ADJUSTMENT OF FM MOD. (VC-M7E/M33E)

Measuring instrument	Frequency counter Oscilloscope
Mode	Record/Playback
Input signal	EIA (NTSC 4.43) colour bar (1.0Vp-p)
Test point	TP202, TP204 (GND) VIDEO OUT jack
Control	R272 FM MOD. control
Specification	$3.4 \pm 0.05\text{MHz}$ $1.0 \pm 0.04\text{Vp-p}$

1. Set the "NTSC MODE" switch (slide switch at the back of the unit) to the NT4.43 or NT → PAL CTV position.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this resistor.  
(See Note below.)
3. Connect a frequency counter to test point TP202 (SIG) and TP204 (GND).
4. Put the unit in A/V input mode.  
Do not feed any signal to the VIDEO IN jack.  
(Disconnect any cable from video input terminal.)
5. Under this condition, adjust R272 so that the frequency counter reads 3.4MHz.
6. Under this condition record the EIA colour bar (NTSC 4.43) on tape, rewind and play back.
7. Make sure that the amplitude of the playback colour bar signal is  $1.0 \pm 0.04\text{Vp-p}$  as shown in Figure 5-6.

#### Note:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

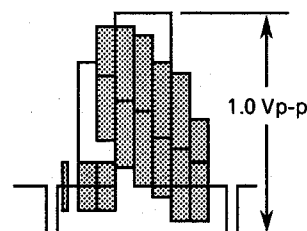


Figure 5-6.

### CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.1\text{Vp-p}$

1. Be sure that E-E level has been correctly specified.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-7.

**Note:**

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

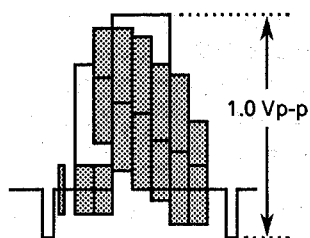


Figure 5-7.

## AUDIO CIRCUIT ADJUSTMENT

### CHECKING OF LINEAR AUDIO E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E or Recording mode
Input signal	1kHz, -8dBs
Test point	AUDIO OUT jack
Specification	$-8 \pm 2\text{dBs}$

1. Feed the audio signal shown in table to the AUDIO IN jack.
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Put the unit in E-E or recording mode with the make sure that the milli-voltmeter reads specified value.

### ADJUSTMENT OF LINEAR AUDIO BIAS CURRENT

Measuring instrument	Oscilloscope
Mode	Record
Input signal	Not required
Test point	TP601 (Sig.) ~ TP602 (GND)
Control	R645 Bias current control
Specification	$2.5 \pm 0.1\text{mVrms}$

1. Connect the oscilloscope to test points TP601 (Sig.) and TP602 (GND).  
(Use TP602 for ground lead.)
2. Put the unit in recording mode with the adjust R645 so that the signal amplitude is 2.5mVrms.

### CHECKING OF LINEAR AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Input signal	Alignment tape. (VROCPZJS)
Test point	AUDIO OUT jack
Specification	$-9.0 \pm 2\text{dBs}$

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Play the alignment tape (VROCPZJS).
3. Make sure that the audio output level is as specified.  
If it is out of specified value, verify the bias current (ADJUSTMENT OF LINEAR AUDIO BIAS CURRENT).

### CHECKING OF NORMAL AUDIO SELF-RECORD/PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Record/Playback
Input signal	1kHz, -8.0dBs
Test point	AUDIO OUT jack
Specification	$-8.0\text{dBs} \pm 3\text{dBs}$

1. Feed the audio signal shown in table to the AUDIO IN jack.
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Make sure so that the milli-voltmeter reads specified value.

### CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T6301
Specification	$70 \pm 5\text{kHz}$ , 40Vp-p or greater

1. Put the unit in record mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is  $70 \pm 5\text{kHz}$ .

## KARAOKE CIRCUIT ADJUSTMENT (VC-M33E/M33DR)

### CHECKING OF MIC 1, 2 LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E
Input signal	1kHz, -62.0dBs (Audio signal)
Test point	AUDIO OUT jack
Specification	-15.0 $\pm$ 3dBs

1. Connect the AC milli-voltmeter to the AUDIO OUT jack.
2. Set the MIC and ECHO controls to the maximum and minimum positions, respectively.
3. Feed an audio signal of 1 kHz, -62.0 dBs to the MIC-1 IN jack.
4. Set the unit to the E-E mode.
5. Check to see if the AC milli-voltmeter reading is as specified.
6. Do the same steps for the MIC-2 IN jack.
7. Turn the MIC control and make sure the audio signal level varies accordingly. Finally return the control to the center (click) position.

### CHECKING OF ECHO

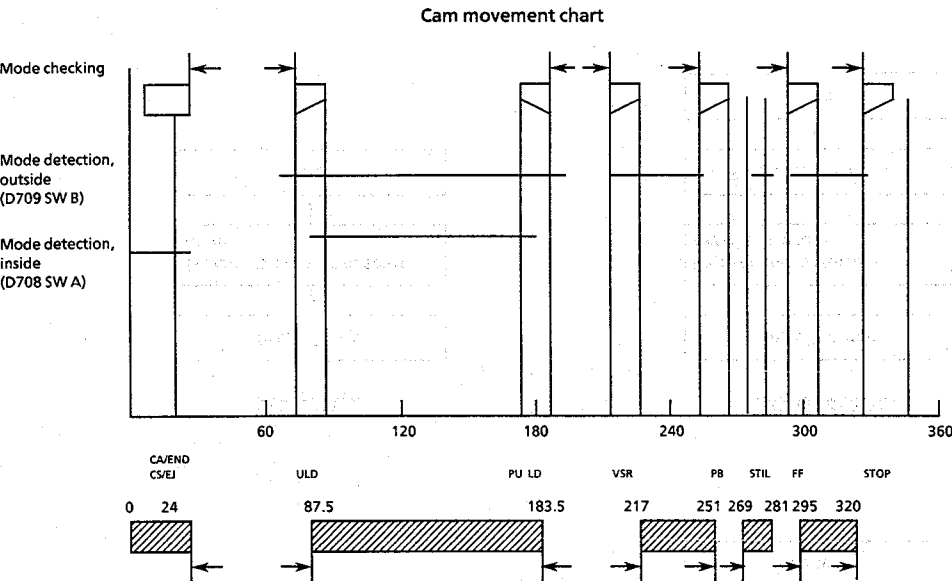
Mode	E-E
Input signal	1kHz, -62.0dBs (Audio signal)
Test point	AUDIO OUT jack
Specification	_____

1. Feed an audio signal of 1 kHz, -62.0 dBs to the MIC-1 IN jack.
2. Set the unit to the E-E mode.
3. Turn the ECHO control to the minimum position and see if the echo is not activated.
4. Turn the ECHO control to the maximum or center position and see if the echo is activated.

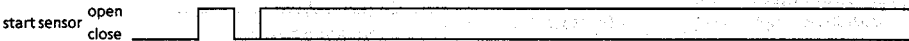
6. MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE

MECHANISM OPERATION FLOWCHART

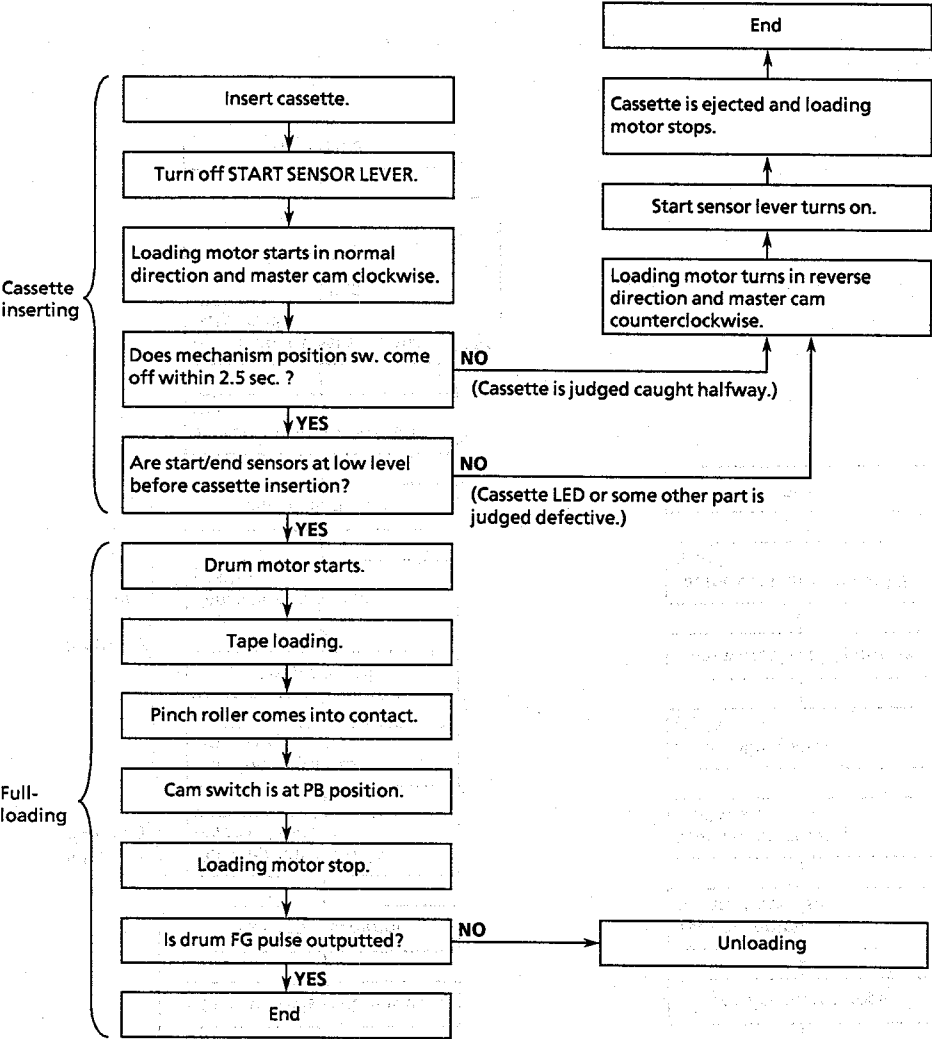
\* This flowchart describes the outline of the mechanism's operation, but does not give its details.



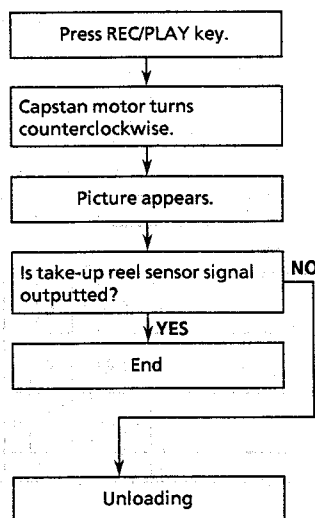
	CS/EJ						ULD		PU LD		VSR		PB	STL	FF	STOP
Mode detection, outside	0	0	0	0	0	1	1		1	1	0	1	0	1	0	0
Mode detection, inside	1	1	0	0	0	0	1		1	0	0	0	0	0	0	0
S sensor	1	1	0	1	1	0										



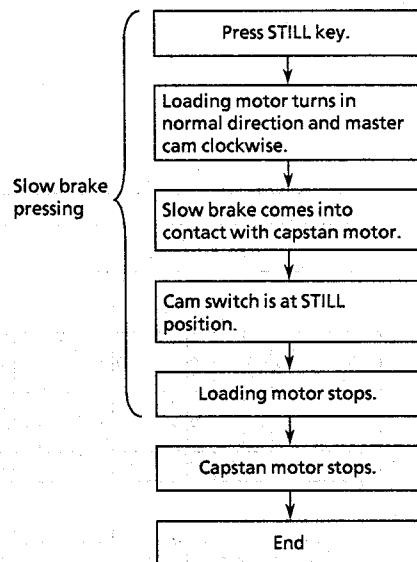
CASSETTE INSERTION → STOP



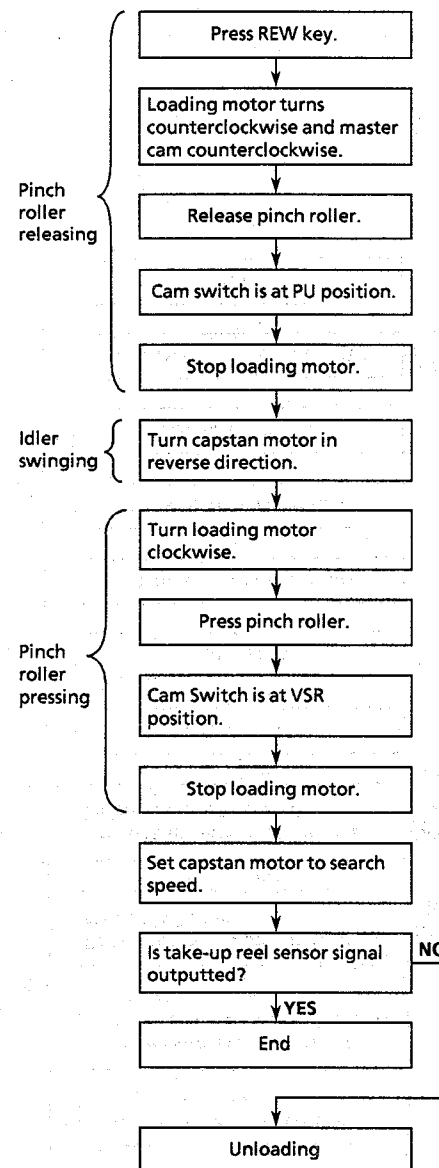
STOP → REC/PLAY



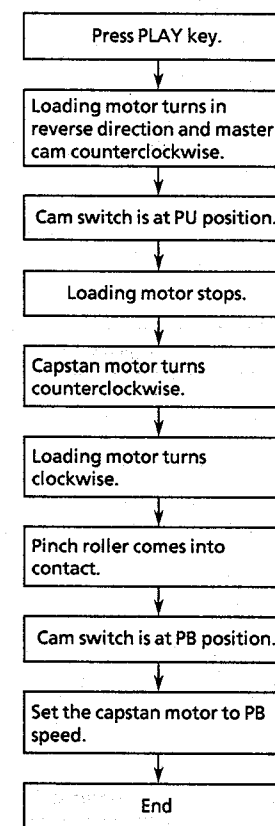
PLAY → STILL



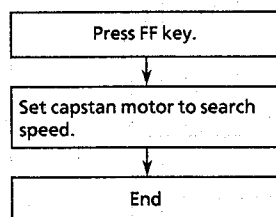
PLAY → VSR



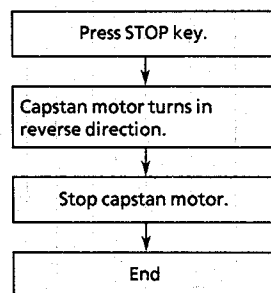
VSR → PLAY



PLAY → VSF

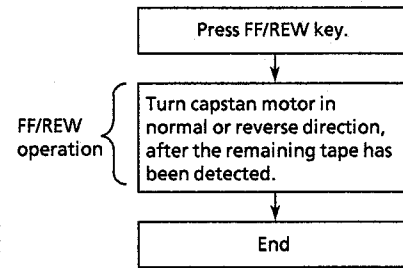


REC/PLAY → STOP

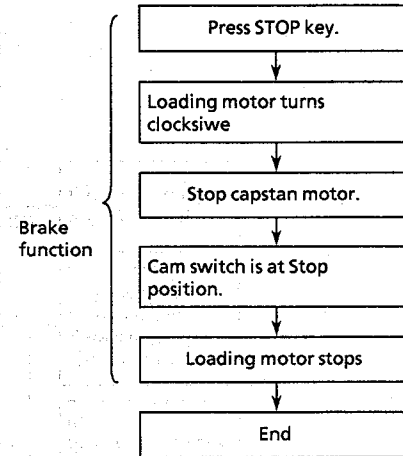




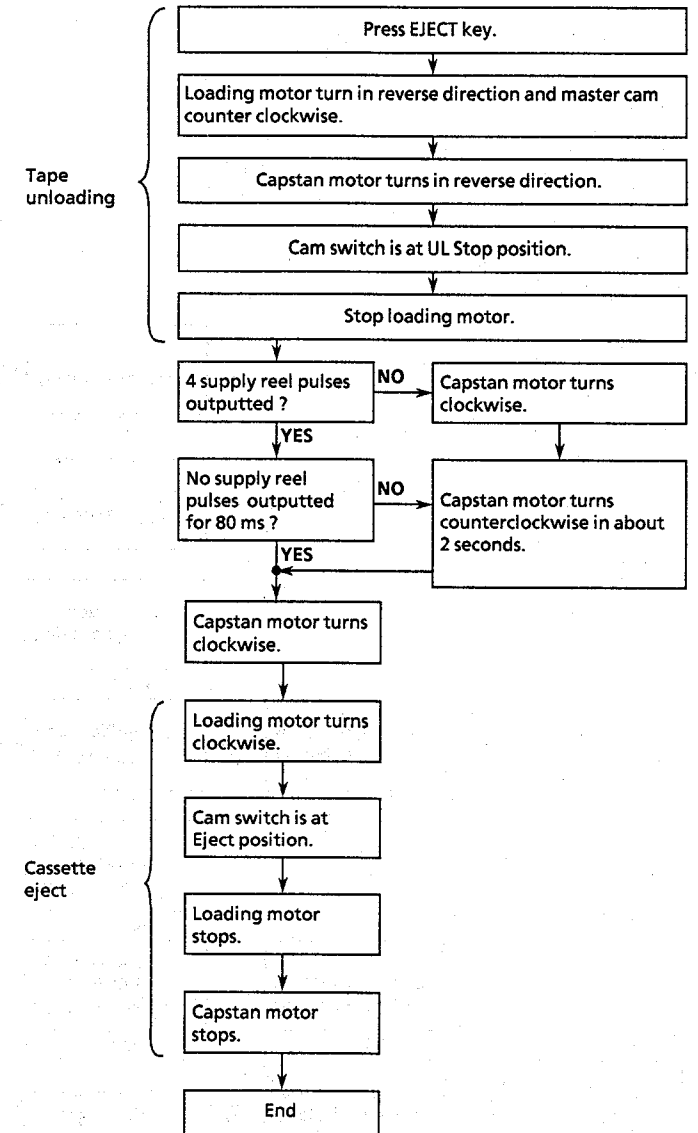
### STOP → FF/REW



### FF/REW → STOP



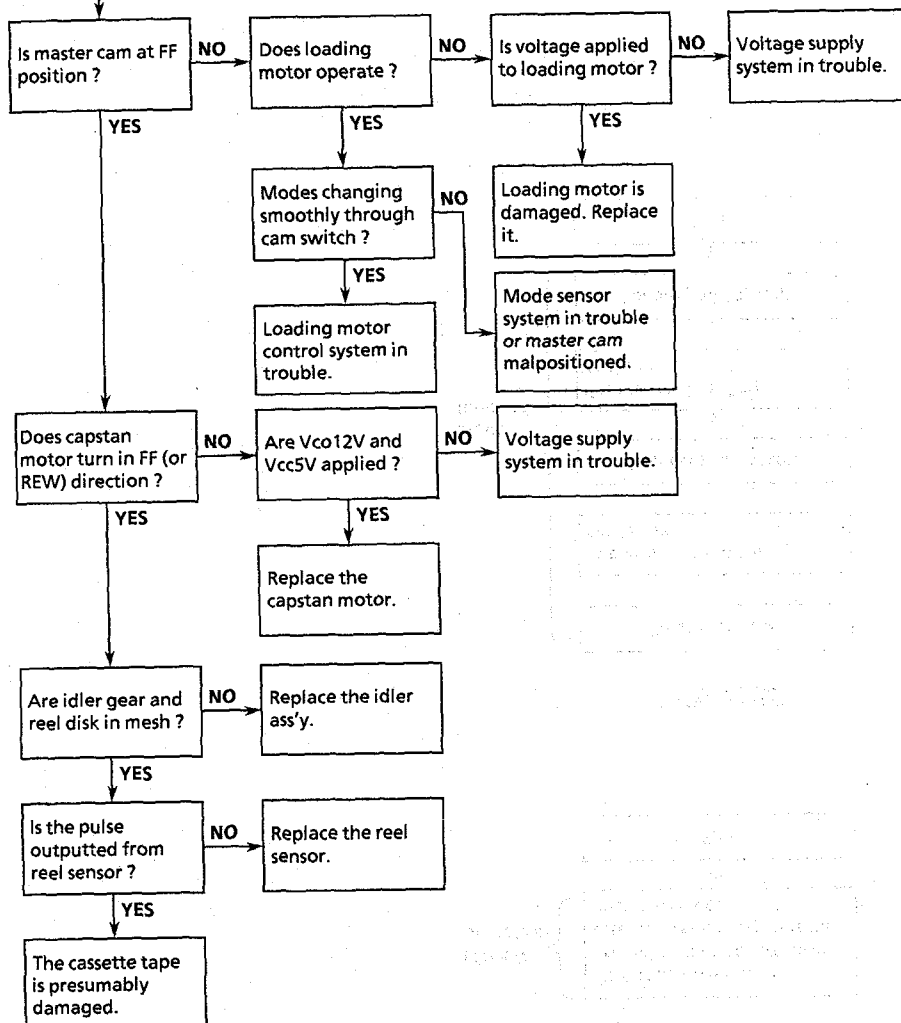
### STOP → CASSETTE EJECT



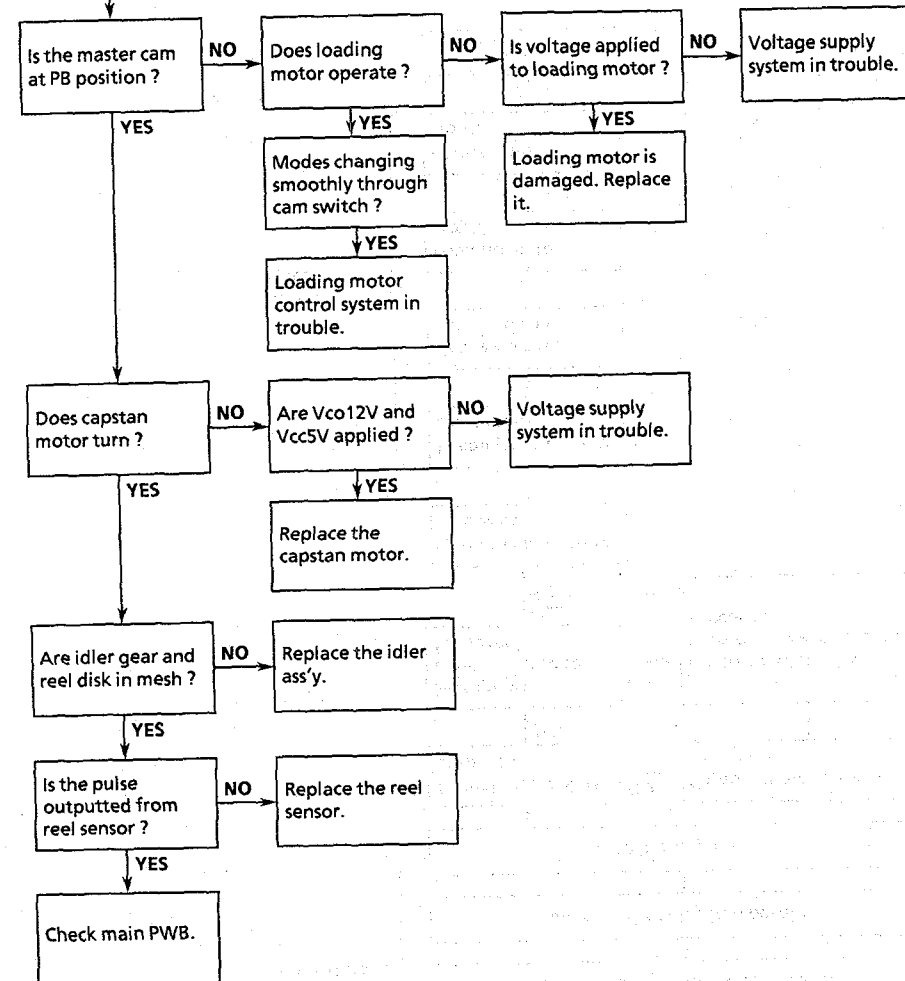
## MECHANISM TROUBLESHOOTING

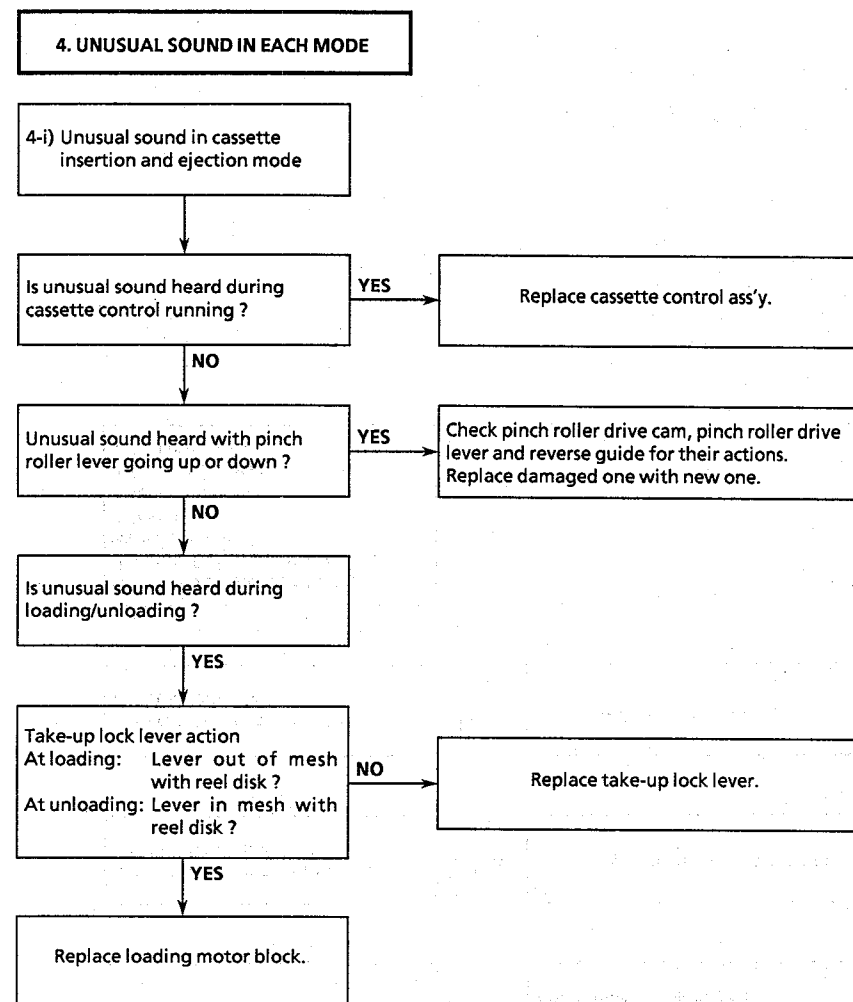
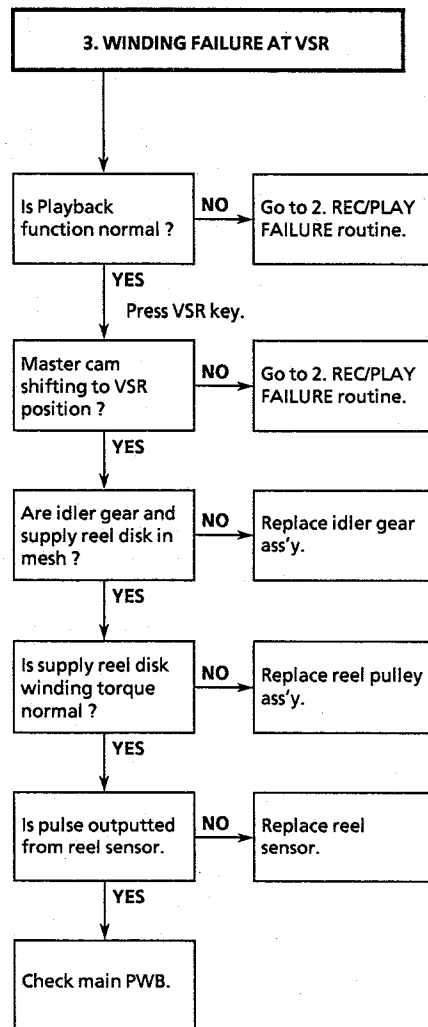
### 1. FF/REW FAILURE (NO TAPE WINDING)

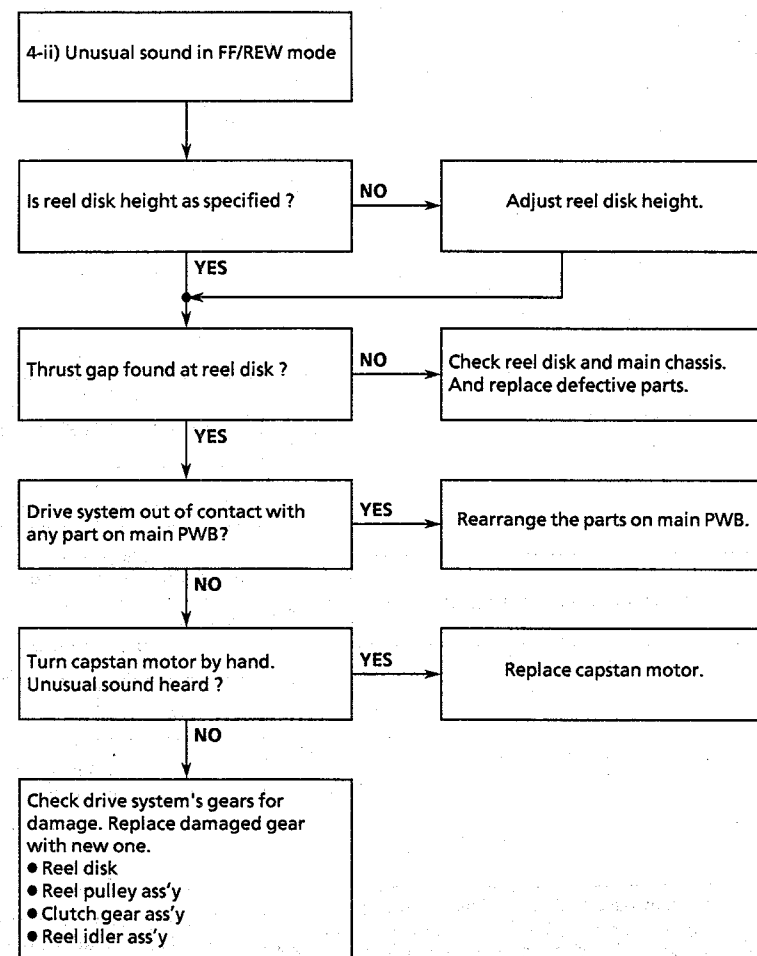
Press FF key.



### 2. REC/PLAY FAILURE (MODE RELEASE)

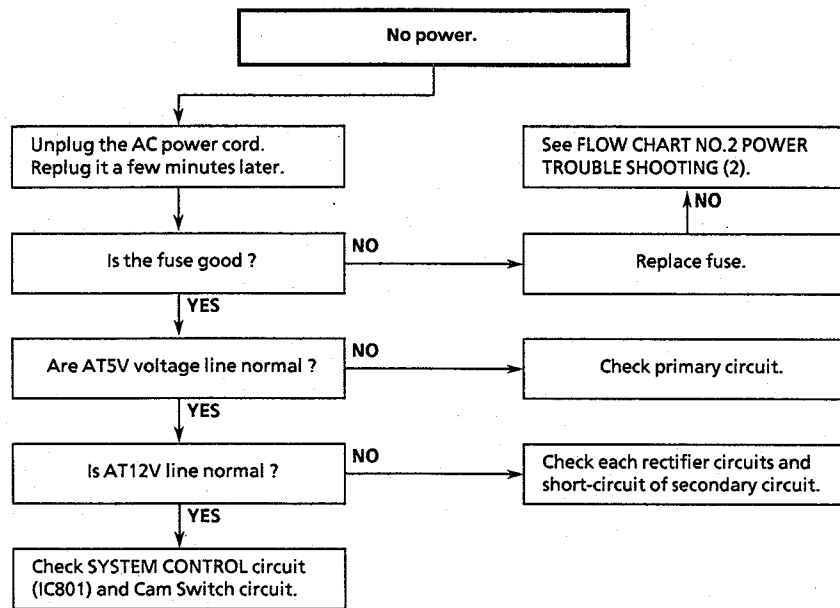




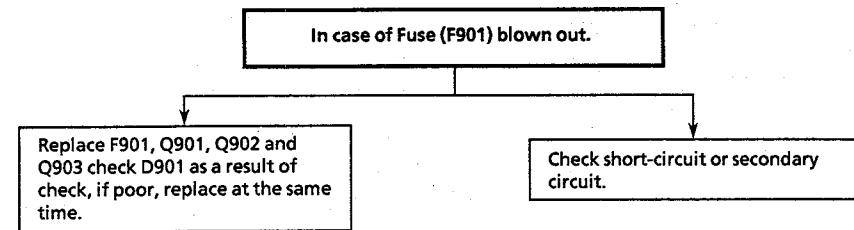


## 7. TROUBLESHOOTING

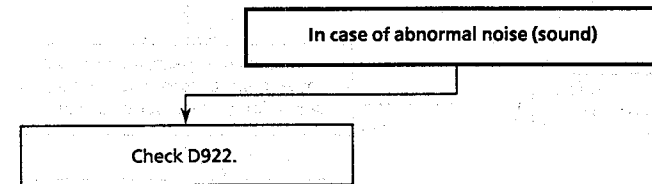
FLOW CHART NO.1 POWER TROUBLESHOOTING (1)



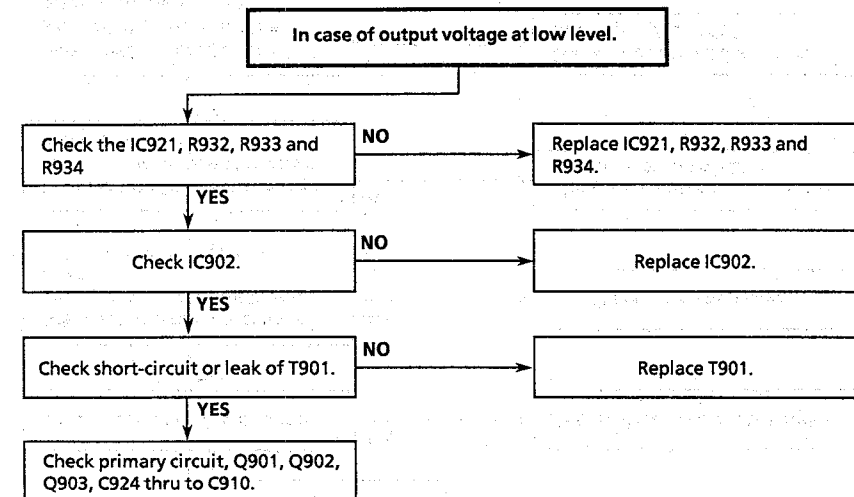
FLOW CHART NO.2 POWER TROUBLESHOOTING (2)



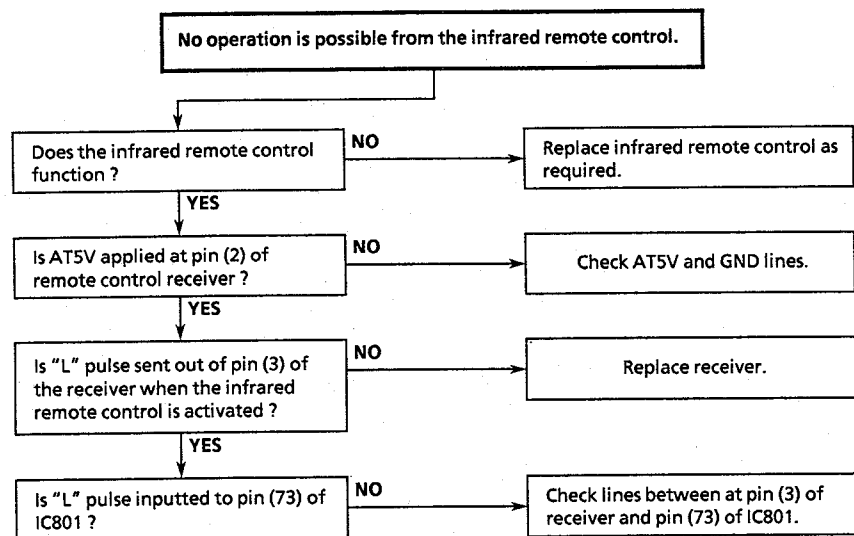
FLOW CHART NO.3 POWER TROUBLESHOOTING (3)



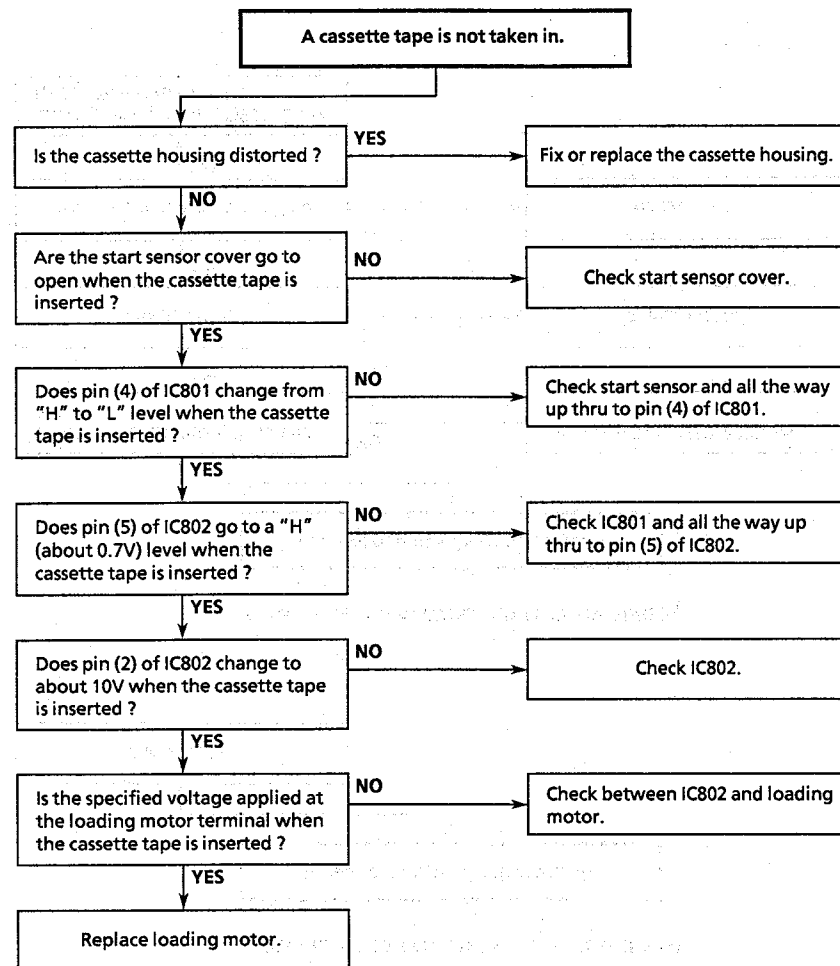
FLOW CHART NO.4 POWER TROUBLESHOOTING (4)



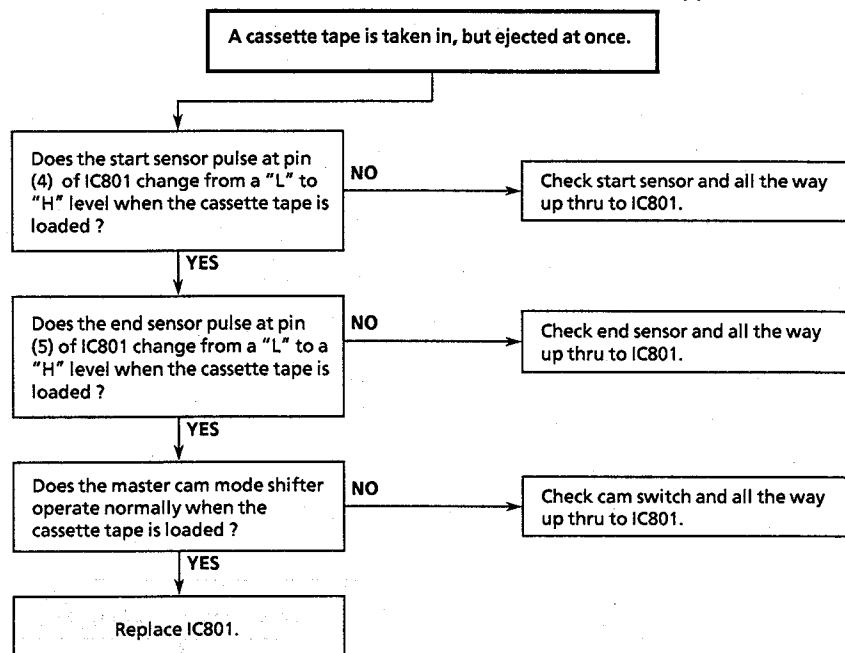
FLOW CHART NO.5 INFRARED R/C TROUBLESHOOTING



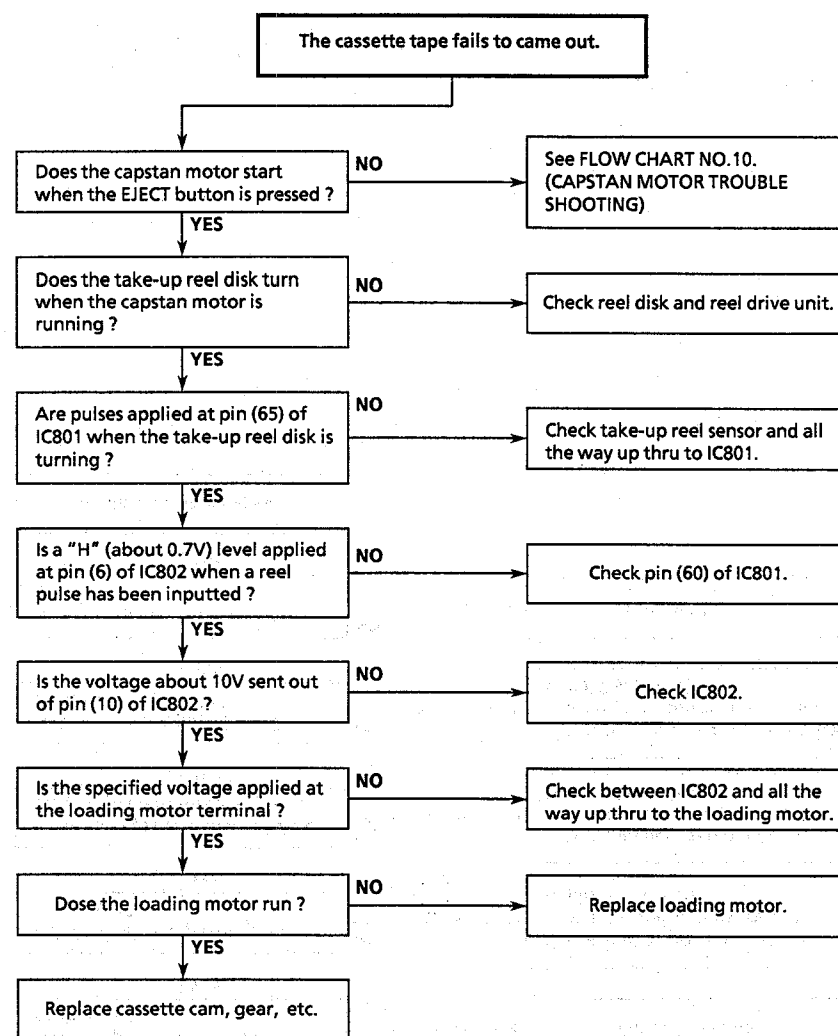
FLOW CHART NO.6 CASSETTE CONTROL TROUBLESHOOTING (1)



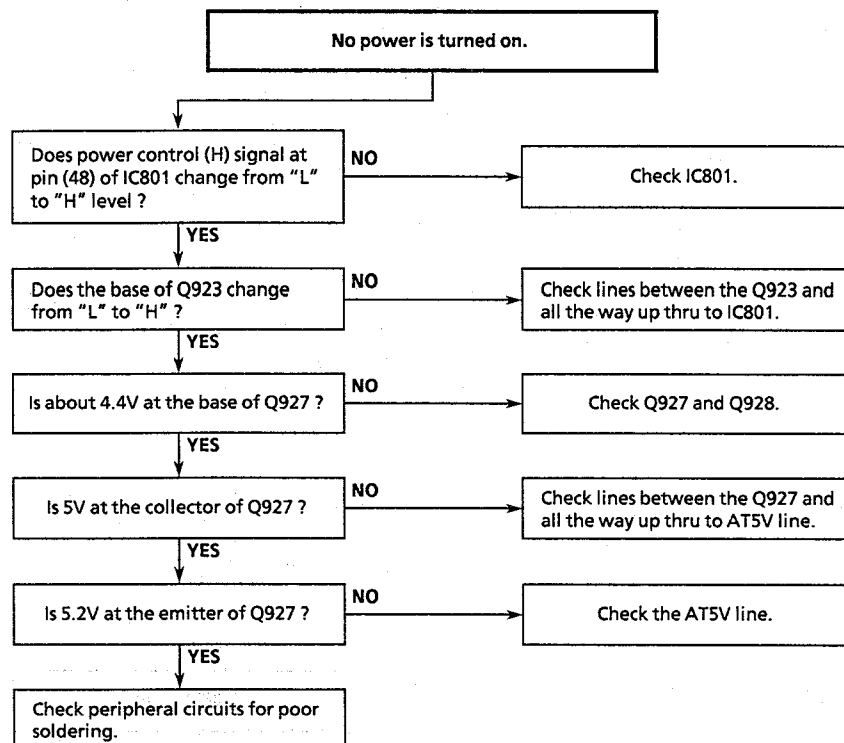
FLOW CHART NO.7 CASSETTE CONTROL TROUBLESHOOTING (2)



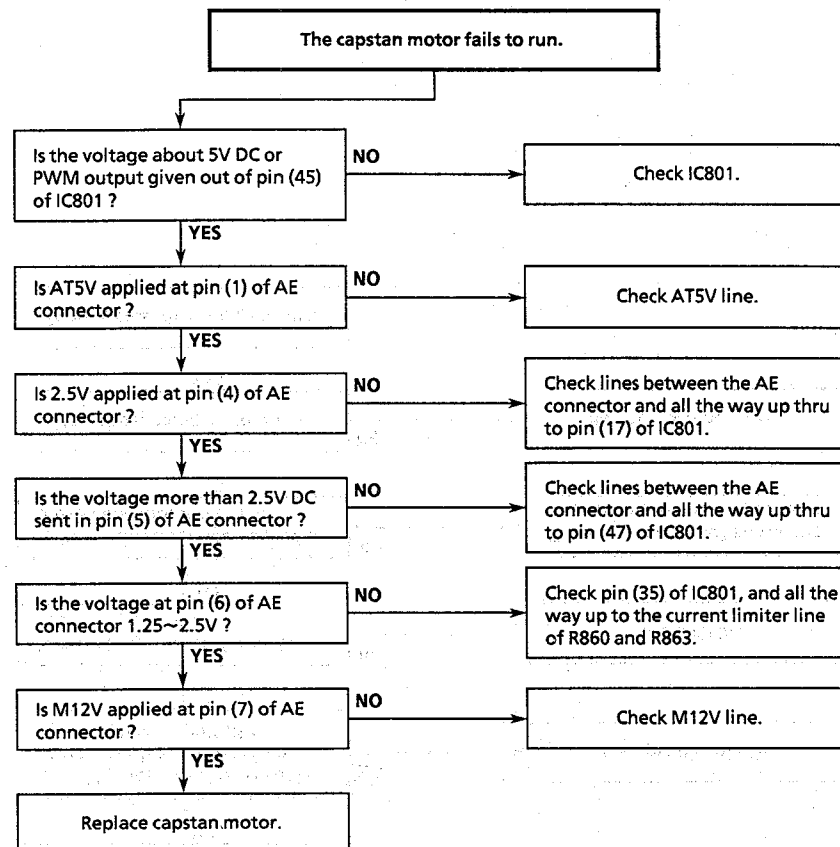
FLOW CHART NO.8 LOADING MOTOR AND EJECT TROUBLESHOOTING



FLOW CHART NO.9 SYSTEM CONTROL TROUBLESHOOTING

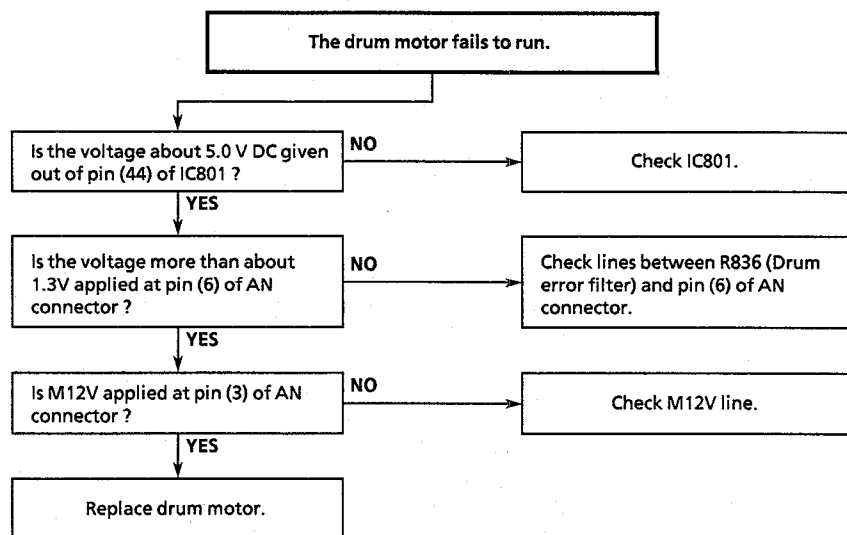


FLOW CHART NO.10 CAPSTAN MOTOR TROUBLESHOOTING

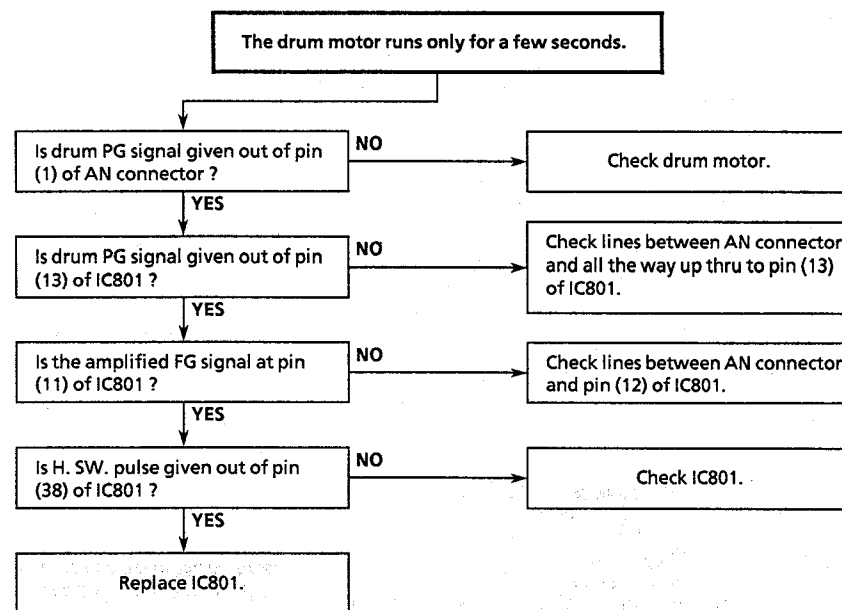




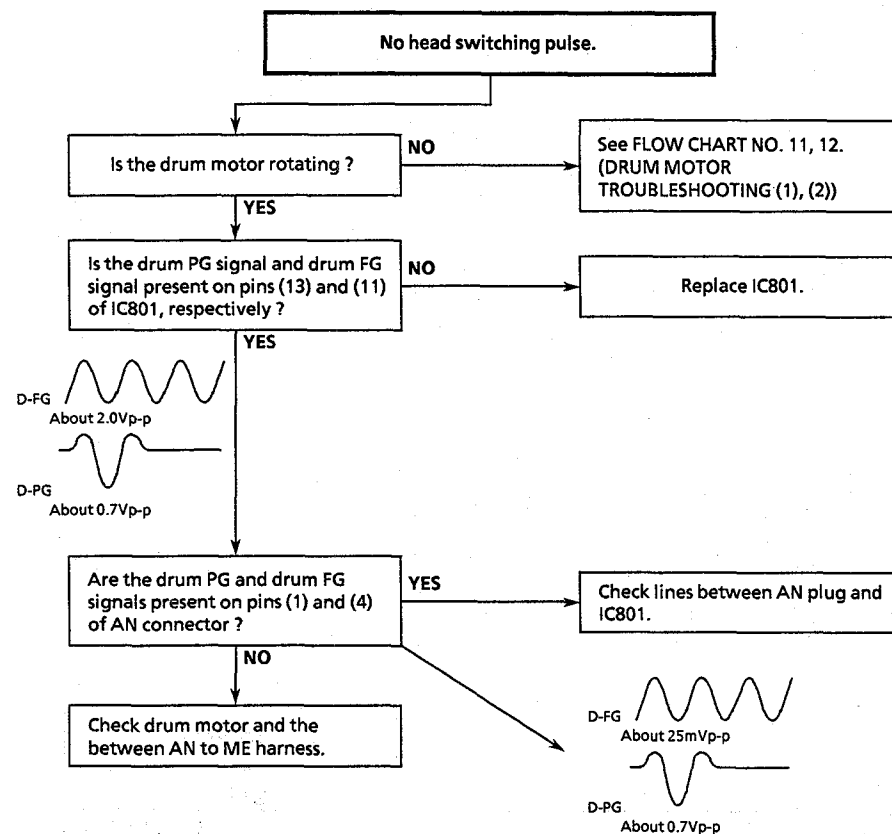
FLOW CHART NO.11 DRUM MOTOR TROUBLESHOOTING (1)



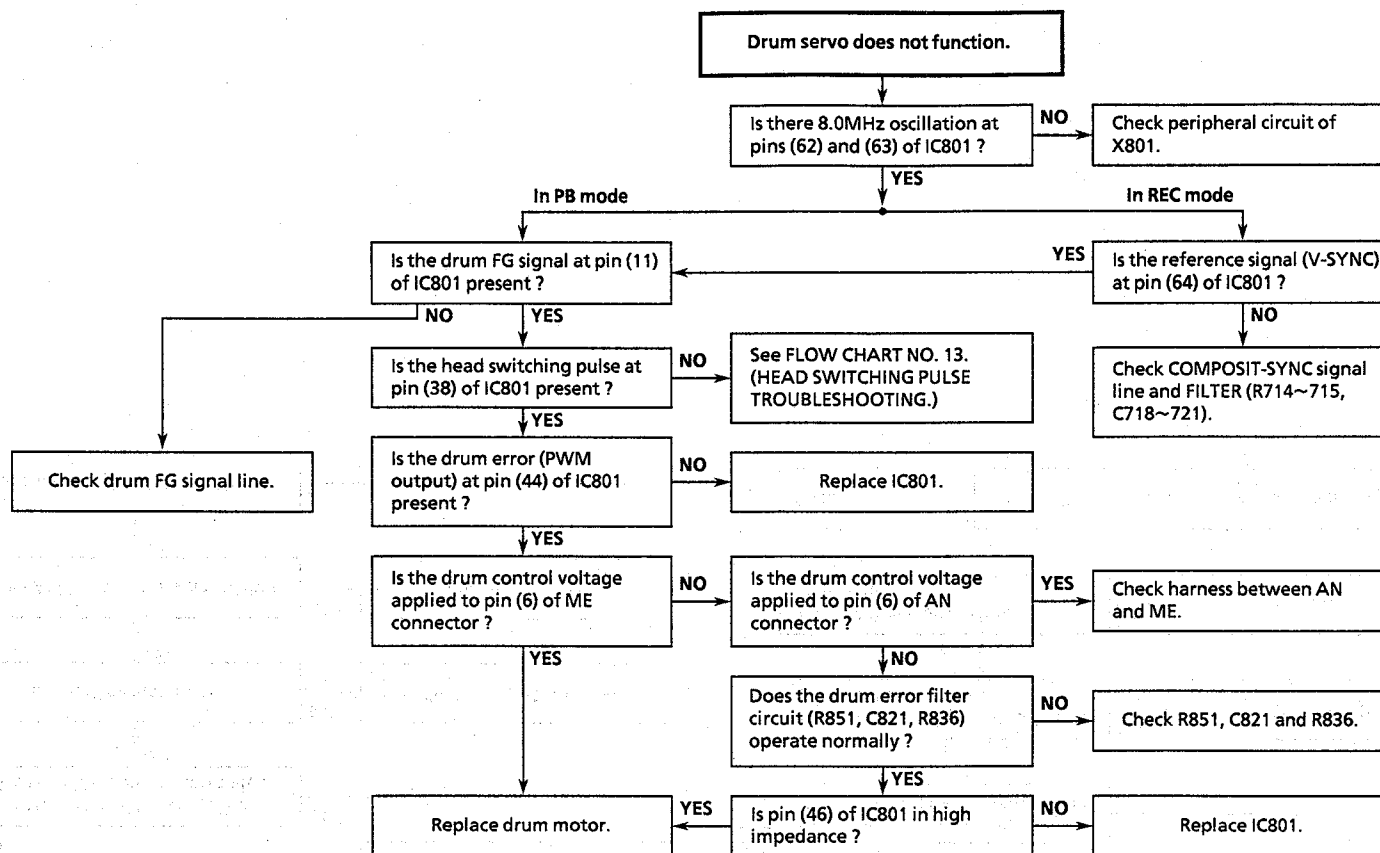
FLOW CHART NO.12 DRUM MOTOR TROUBLESHOOTING (2)



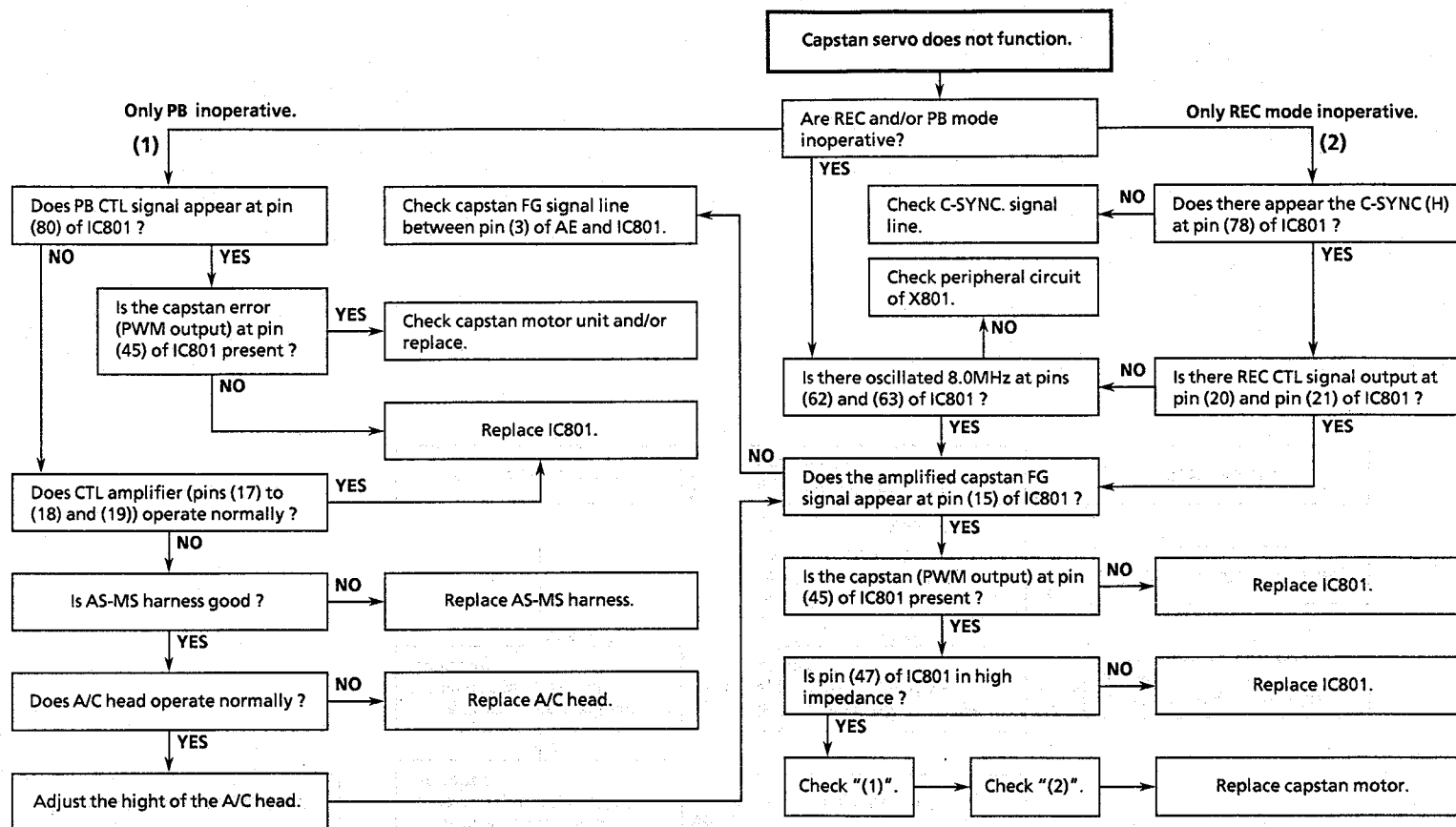
# FLOW CHART NO.13 HEAD SWITCHING PULSE TROUBLESHOOTING



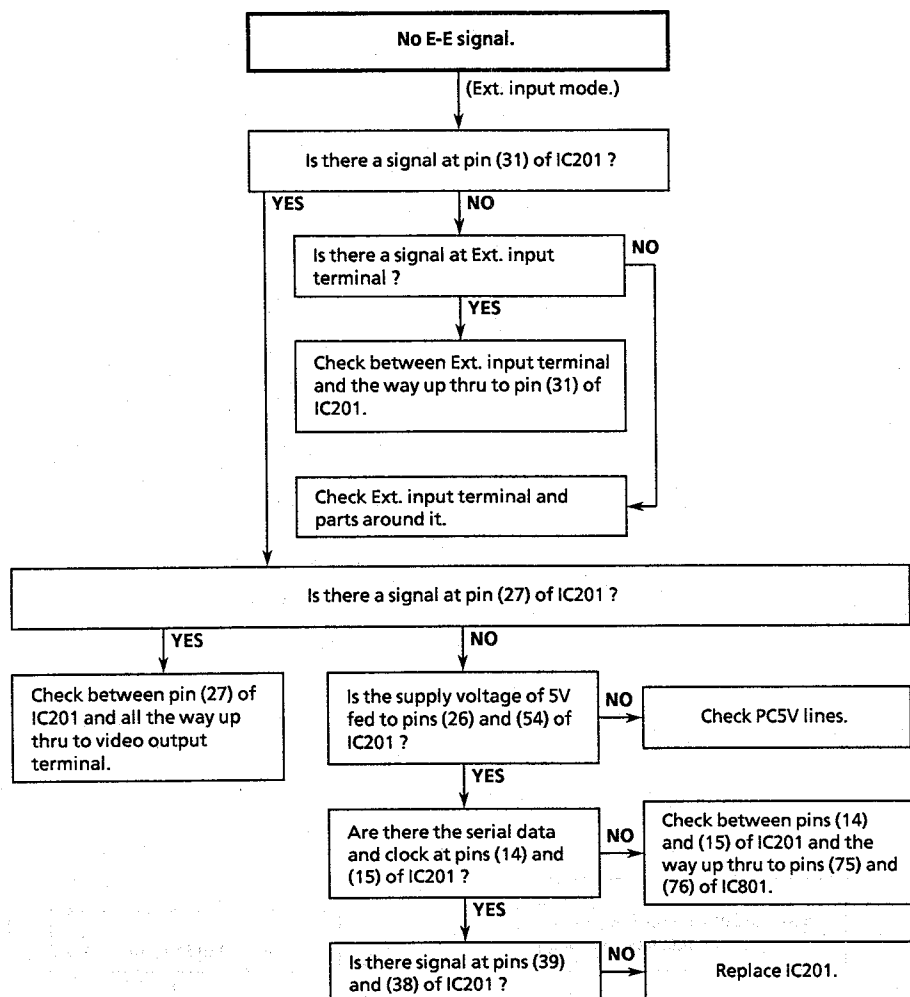
FLOW CHART NO.14 DRUM SERVO TROUBLESHOOTING



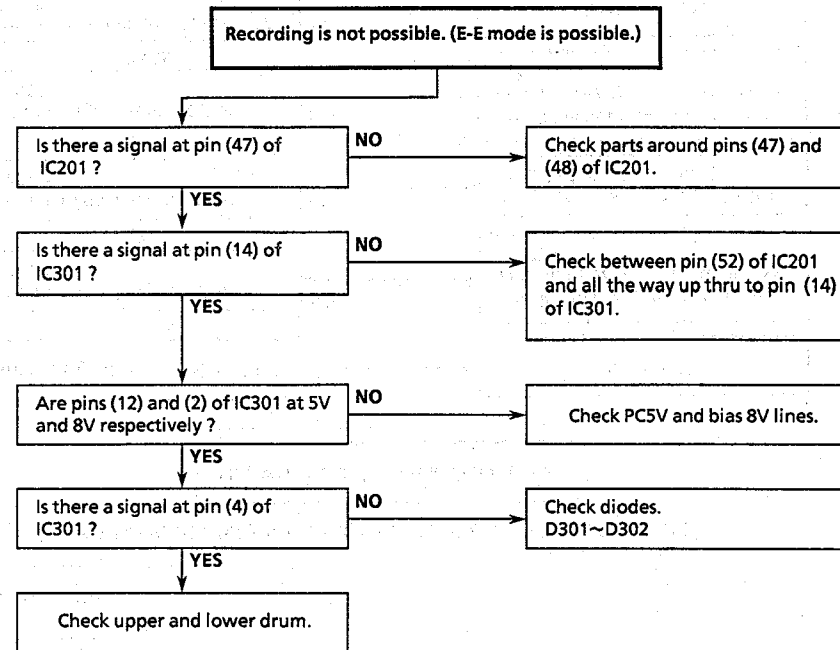
FLOW CHART NO.15 CAPSTAN SERVO TROUBLESHOOTING



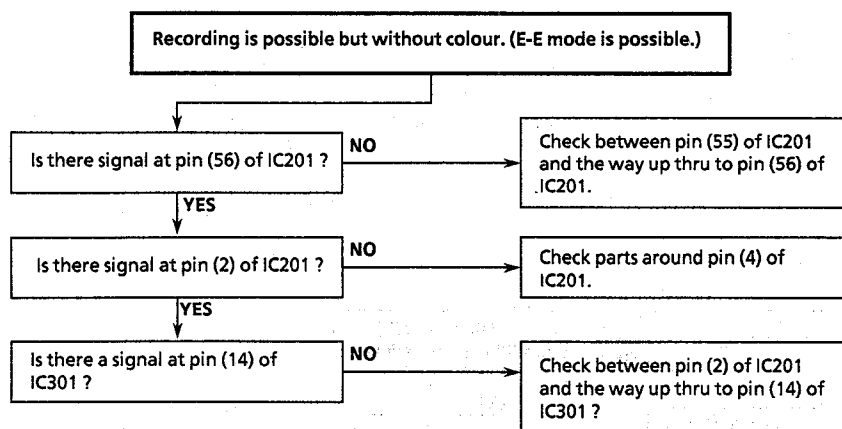
FLOW CHART NO.16 E-E MODE TROUBLESHOOTING



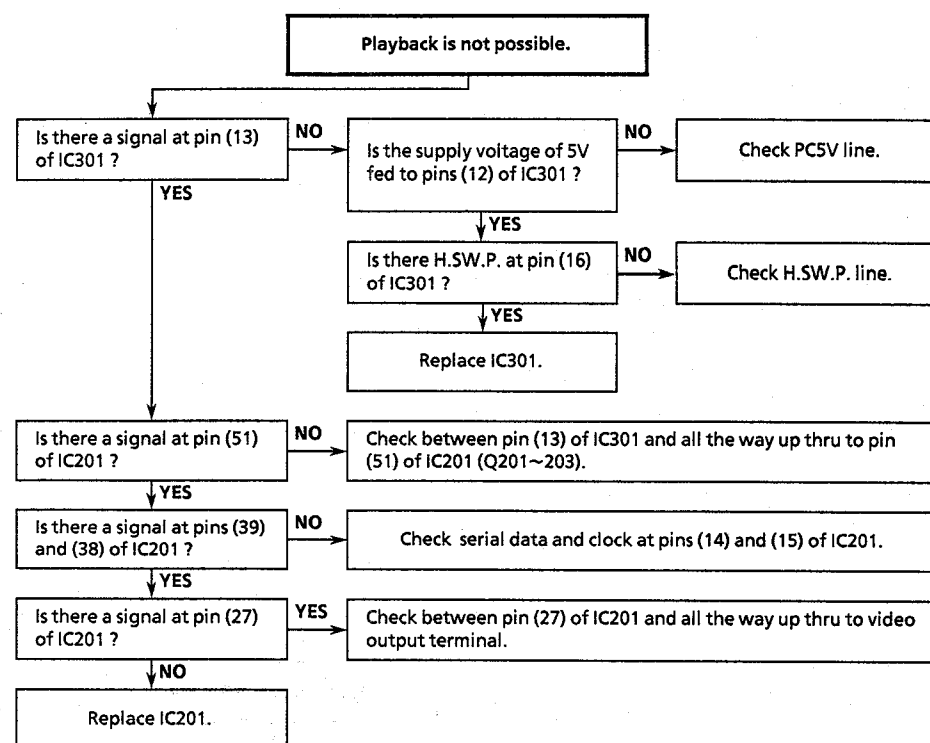
FLOW CHART NO.17 RECORDING MODE (LUMINANCE) TROUBLESHOOTING



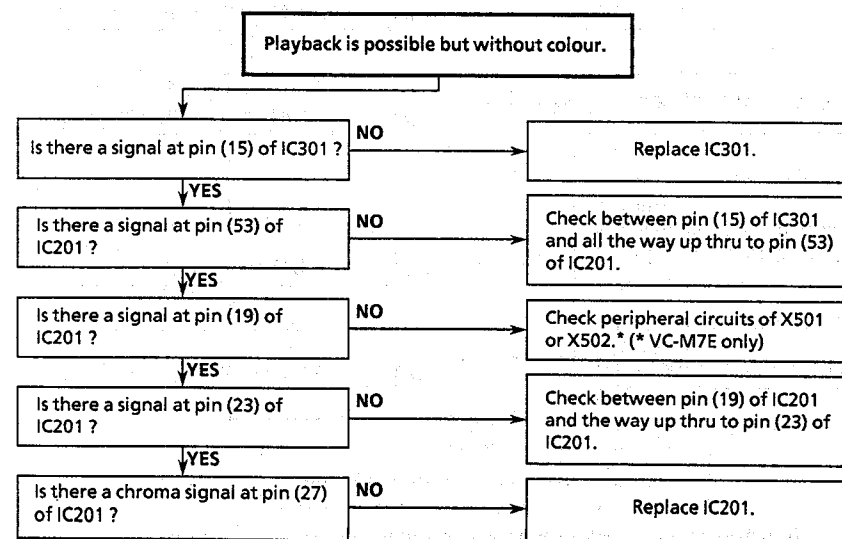
FLOW CHART NO.18 RECORDING MODE (CHROMA) TROUBLESHOOTING



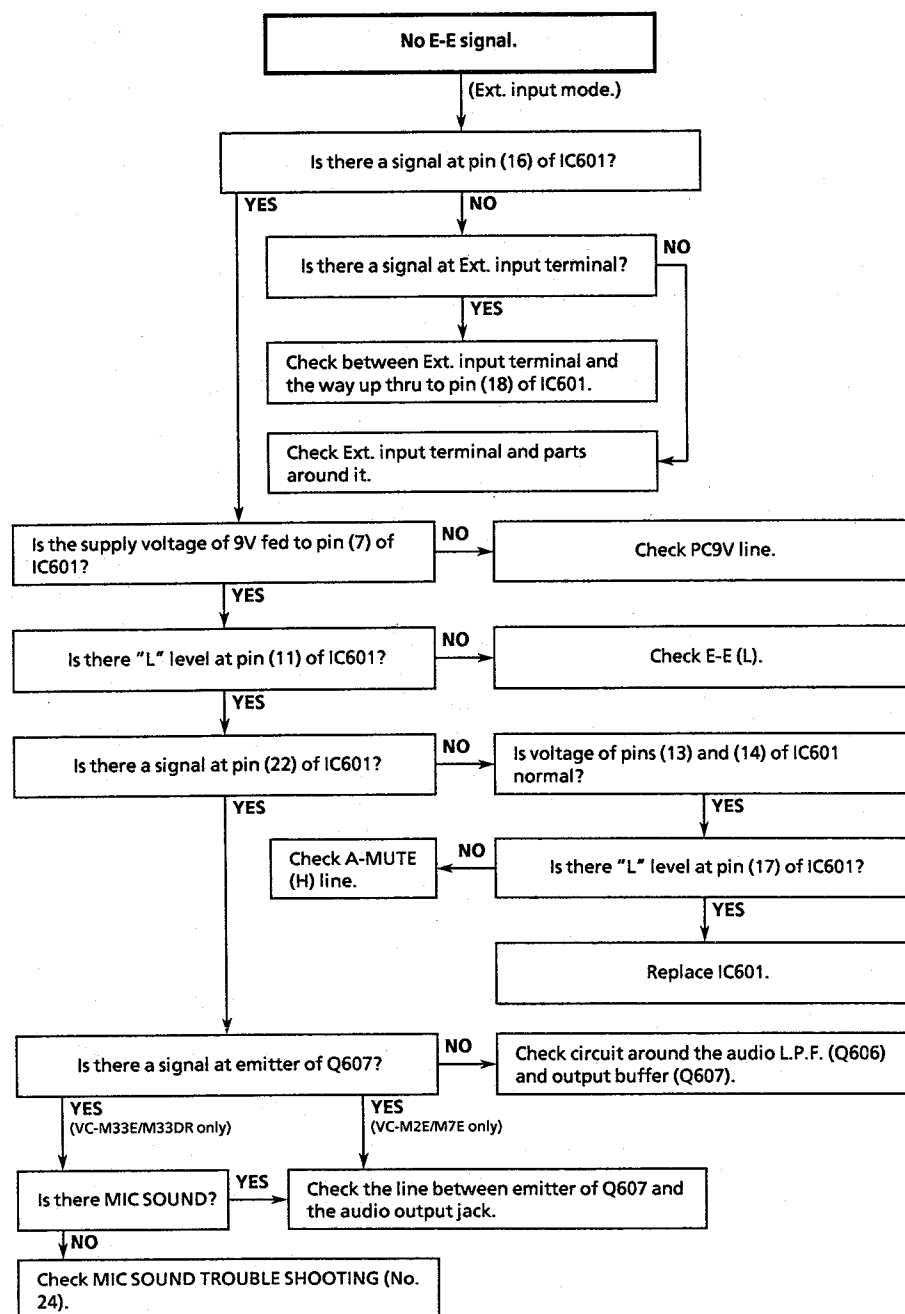
FLOW CHART NO.19 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING



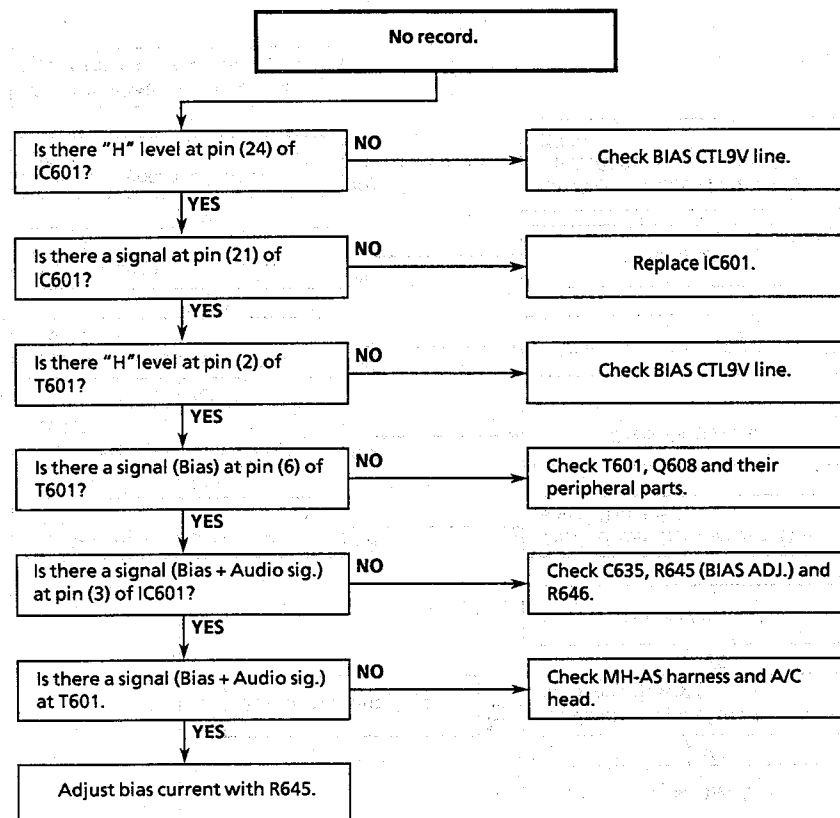
FLOW CHART NO.20 PLAYBACK MODE (CHROMA) TROUBLESHOOTING



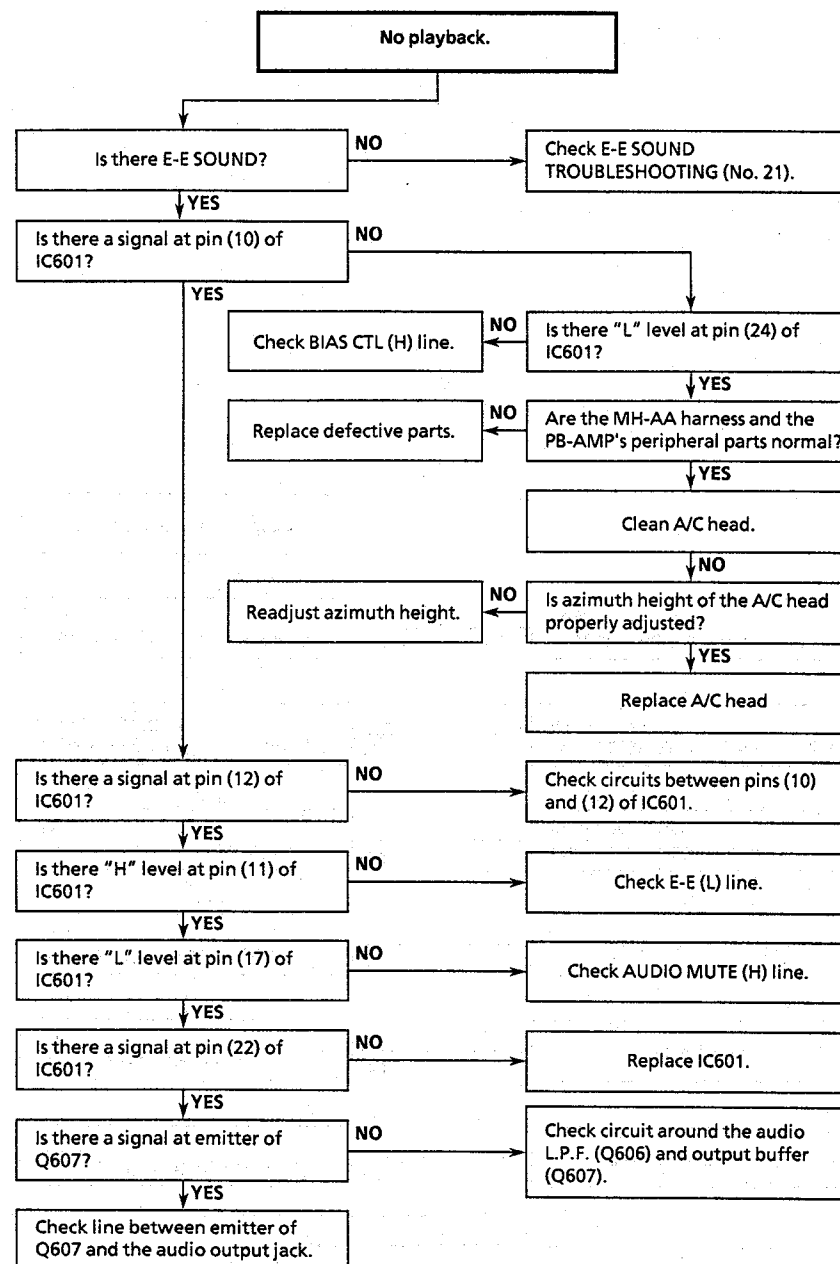
FLOW CHART NO.21 LINEAR SOUND E-E MODE TROUBLESHOOTING



FLOW CHART NO.22 LINEAR SOUND RECORDING MODE TROUBLESHOOTING

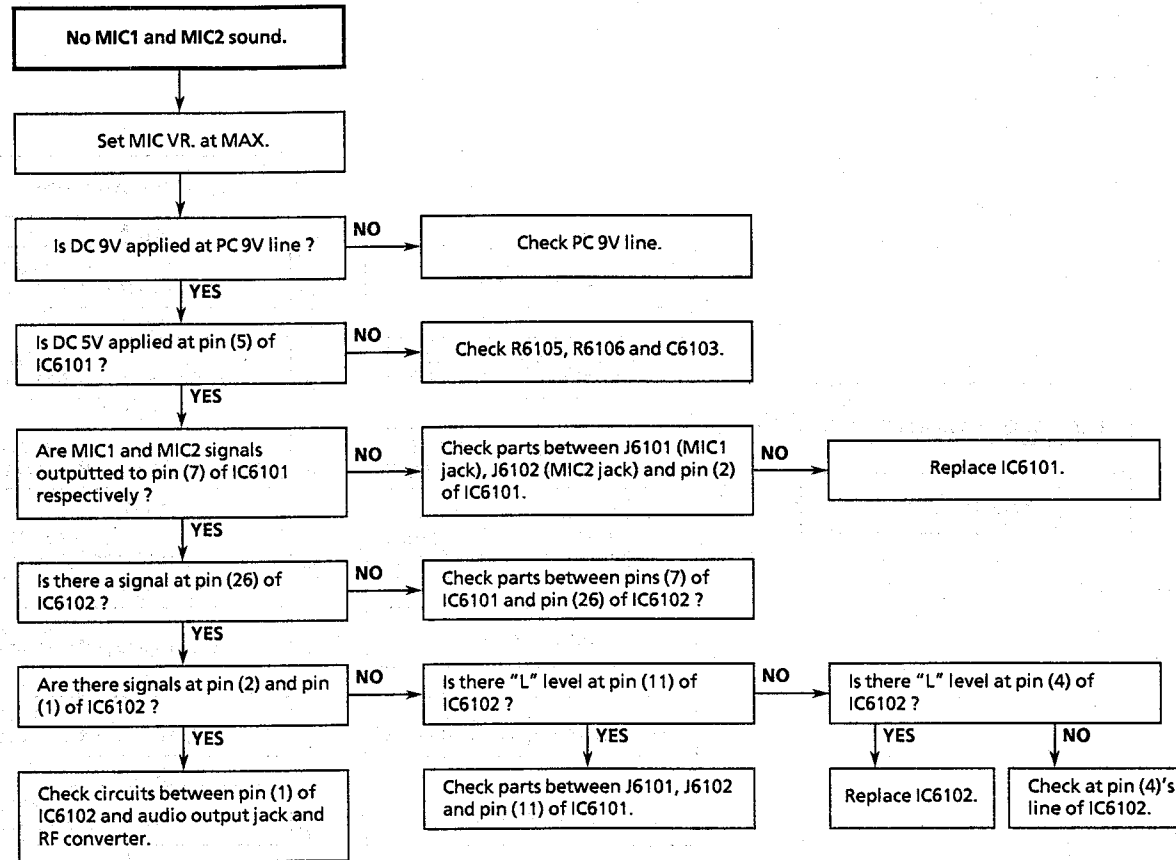


FLOW CHART NO.23 LINEAR SOUND PLAYBACK MODE TROUBLESHOOTING

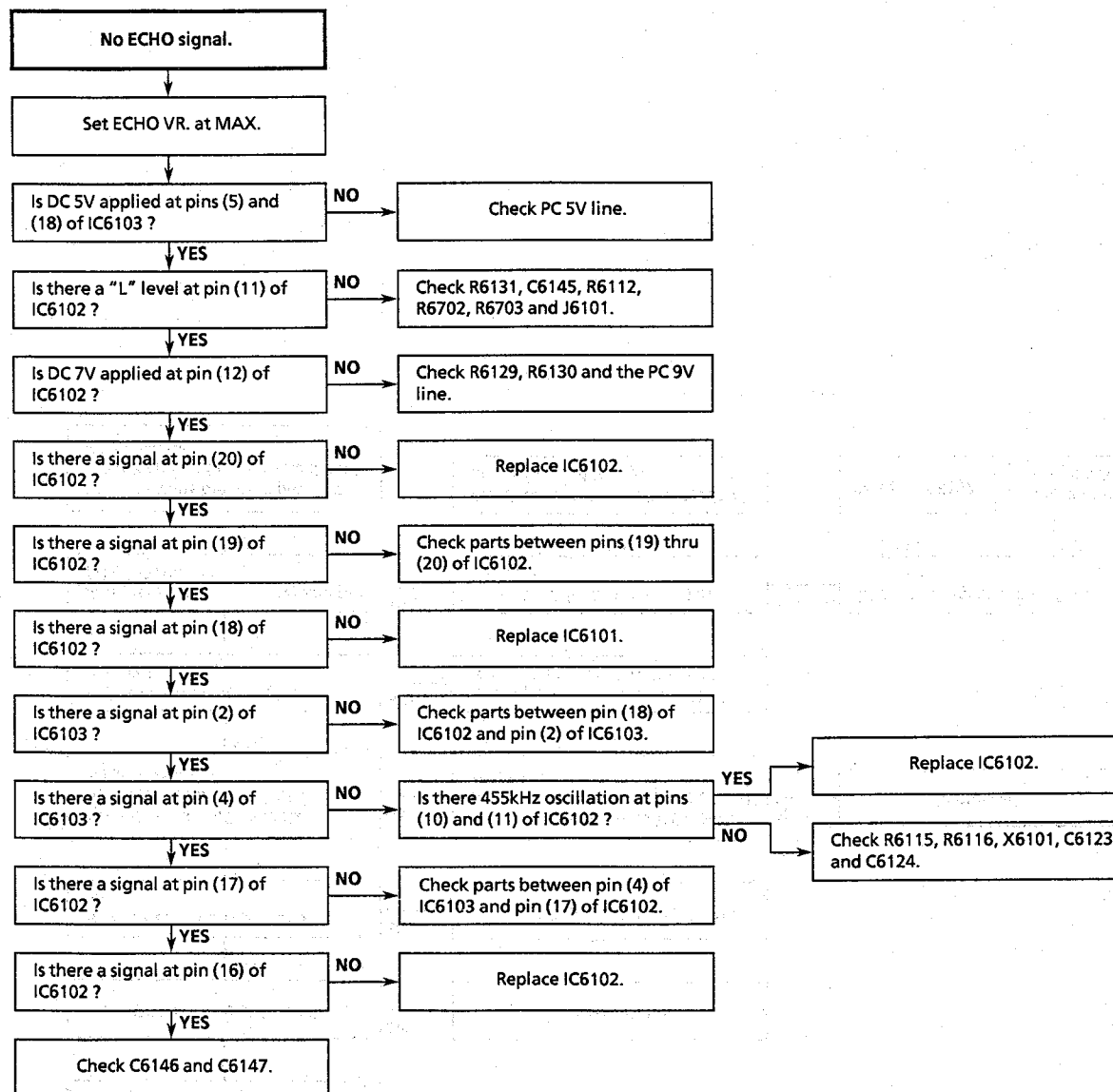




FLOW CHART NO.24 MIC SOUND TROUBLESHOOTING (VC-M33E/M33DR)



FLOW CHART NO.25 ECHO SOUND TROUBLESHOOTING (VC-M33E/M33DR)

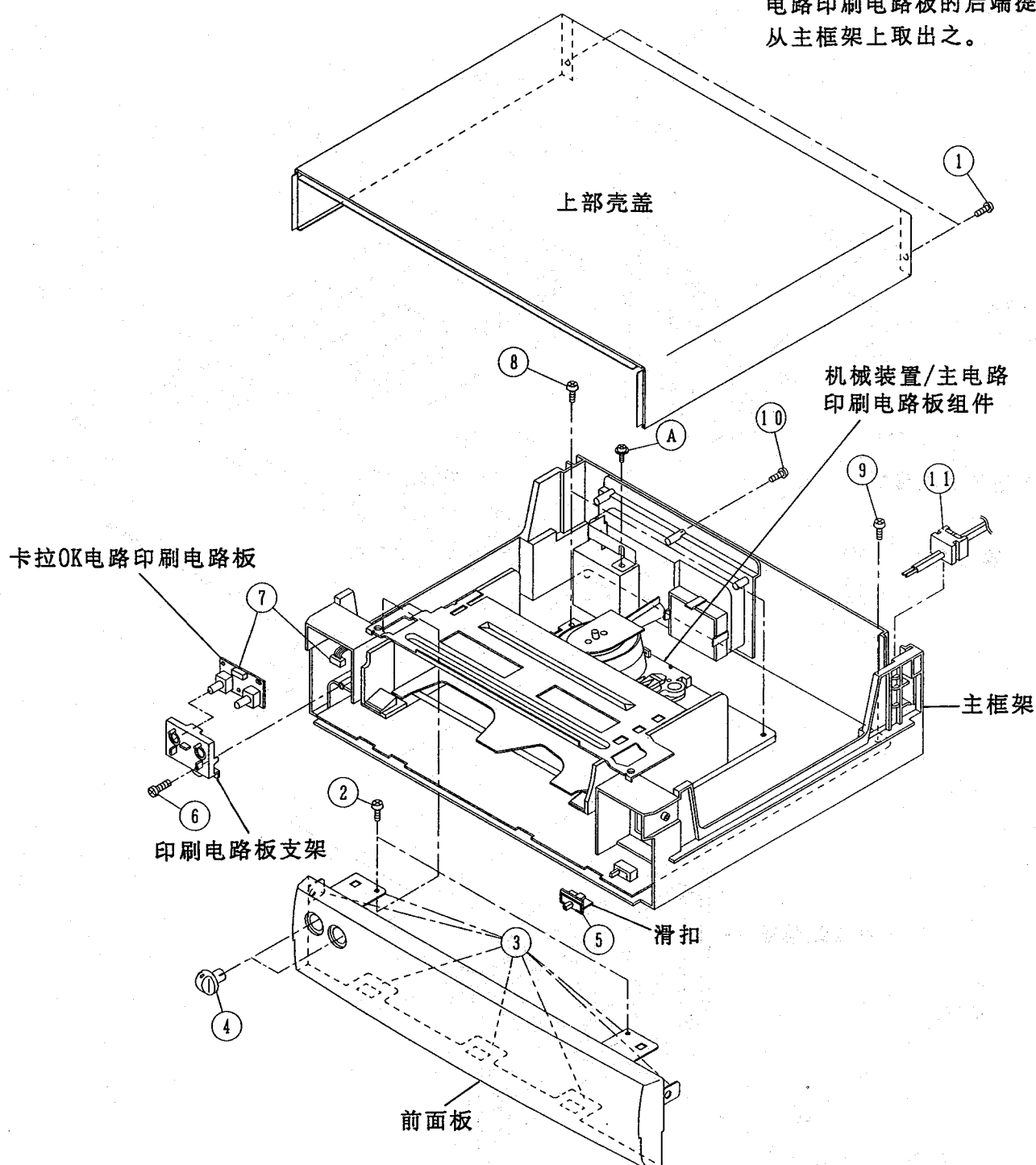


## 2. 分解和组装

### 2-1 主要部件的分解

上部壳盖： 松去两支紧固螺丝(1)。  
前面板： 分别松去两支紧固螺丝(2)。  
接着拆开7支卡销(3)，取出  
前面板，松去两支键扣(4)。  
此时，注意避免松开滑扣(5)。  
印刷电路板支架：松去一支紧固螺丝(6)。  
(型号VC-M33E/M33DR)

卡拉OK电路印刷：拆开导线(7)。  
电路板  
(型号VC-M33E/M33DR)  
机壳接地弯头： 松去一支紧固螺丝(A)。  
机械装置/主电路 分别松去两支紧固螺丝(8)、  
印刷电路板组件： 两支紧固螺丝(9)以及一支  
紧固螺丝(10)，拆开一个  
索环(11)。将机械装置/主  
电路印刷电路板的后端提起，  
从主框架上取出之。



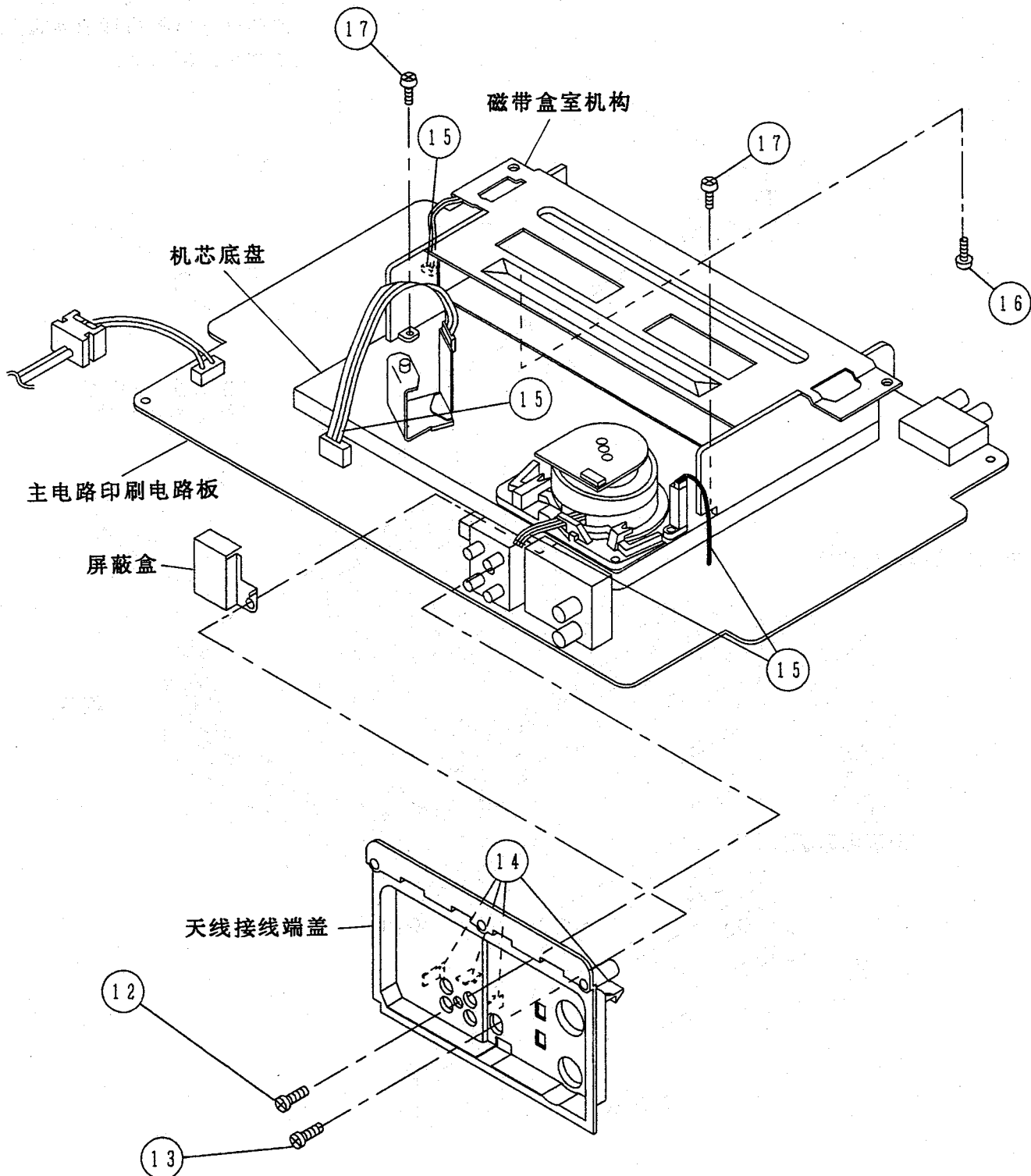
## 2-2 机芯底盘/主电路印刷电路板组件的分解

天线接线端盒 : 松去一支紧固螺丝(12),  
松去一支紧固螺丝(13)。

机芯底盘/磁带盒室 : 然后松开四个卡扣(14),  
机构控制组件 取出屏蔽盒。拆下两根  
全平电缆和两根导线  
(15)。此时, 注意避免  
弄错全平电缆的上下方  
向。

松去一支紧固螺丝(16)。  
将机芯底盘组件往上提  
起, 从主电路印刷电  
路板上取出之。此时, 注  
意避免损坏其周围的零  
件。

磁带盒室机构控制器 : 松去两支紧固螺丝(17)。



## 2-3 盒室控制机构组装的注意事项

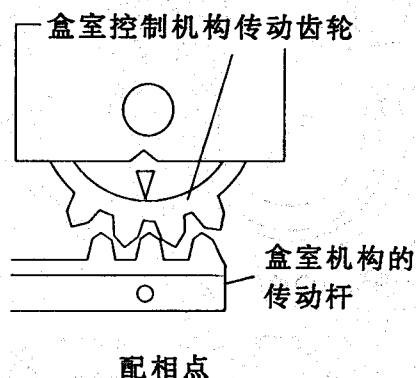
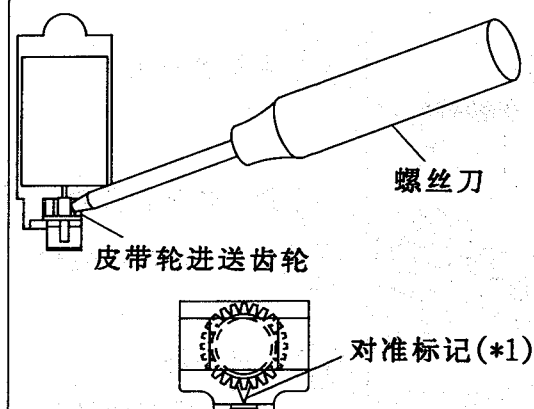
### 盒室控制机构的组装

安置盒室控制器电路于盒室机构之前，先对其自身进行初期设定。初期设定的进行分电路设定和机械设定。

#### 电路设定：

用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001（或跨接销241）和TP5002（或跨接销242）之间，让盒室机构退回至其初始位置(\*1)。确认其动作到位后，再安置盒室控制器电路于其机构之上。

（此方法用于盒室机构已设定好其印刷电路板之场合。）



#### 机械设定：

用螺丝刀拨转磁带装挂马达皮带轮进送齿轮，让盒室机构退回至其初始位置(\*1)。确认其动作到位后，再安置盒室控制器电路于其机构之上。（此方法用于盒室机构未设装印刷电路板之场合。）

### 盒室机构与印刷电路板的连接

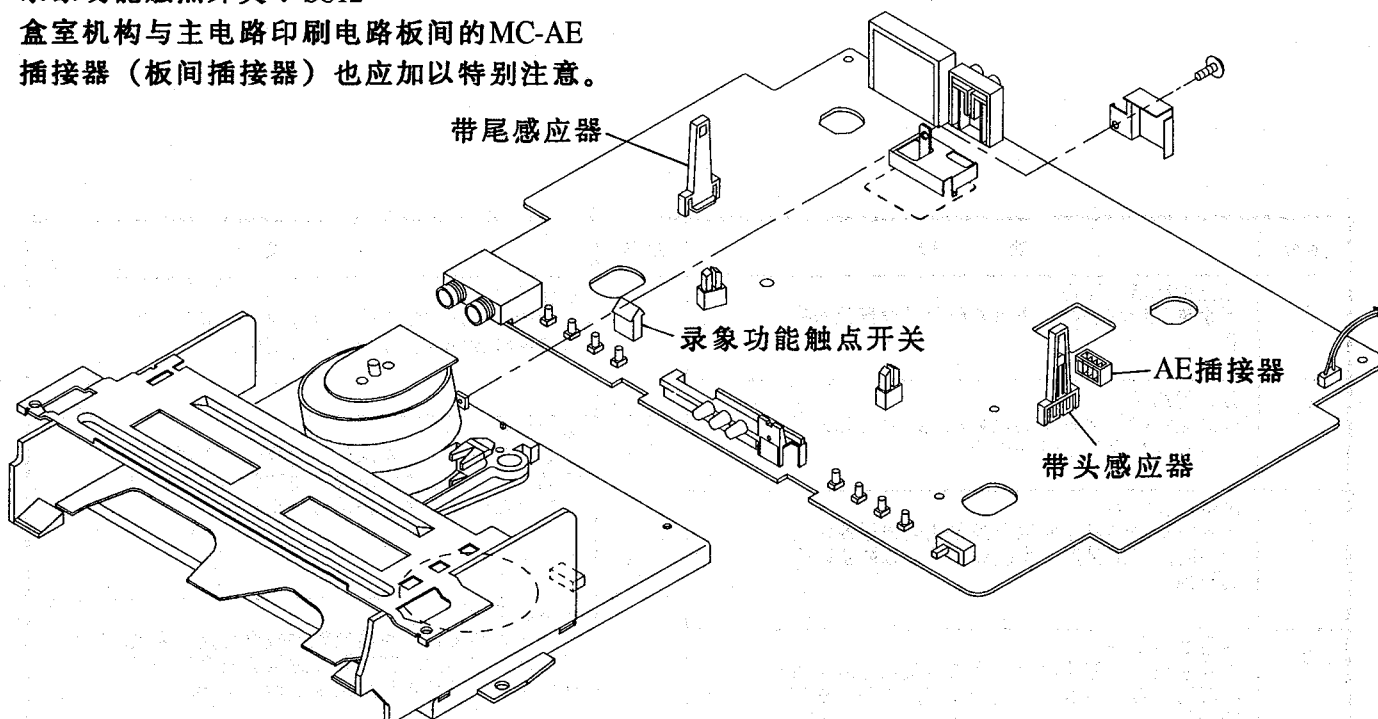
将盒室机构上的两个凸块对准主电路印刷电路板上的两个定位参考记号（圆形为正参考，椭圆形为副参考）。然后垂直放下盒室机构，注意切勿让其机构的边缘部碰伤附近的其它元件。旋紧固定盒室机构和主电路印刷电路的两支螺丝（一支用于固定盒室机构和前置放大器屏蔽，另一支位于主电路印刷电路板焊线侧的磁带装挂马达近旁）。插接盒室机构和主电路印刷电路板间的扁平型电缆插接器（AN和AS）以及导线插接器（AB和AJ）。

#### 应特别注意的元件：

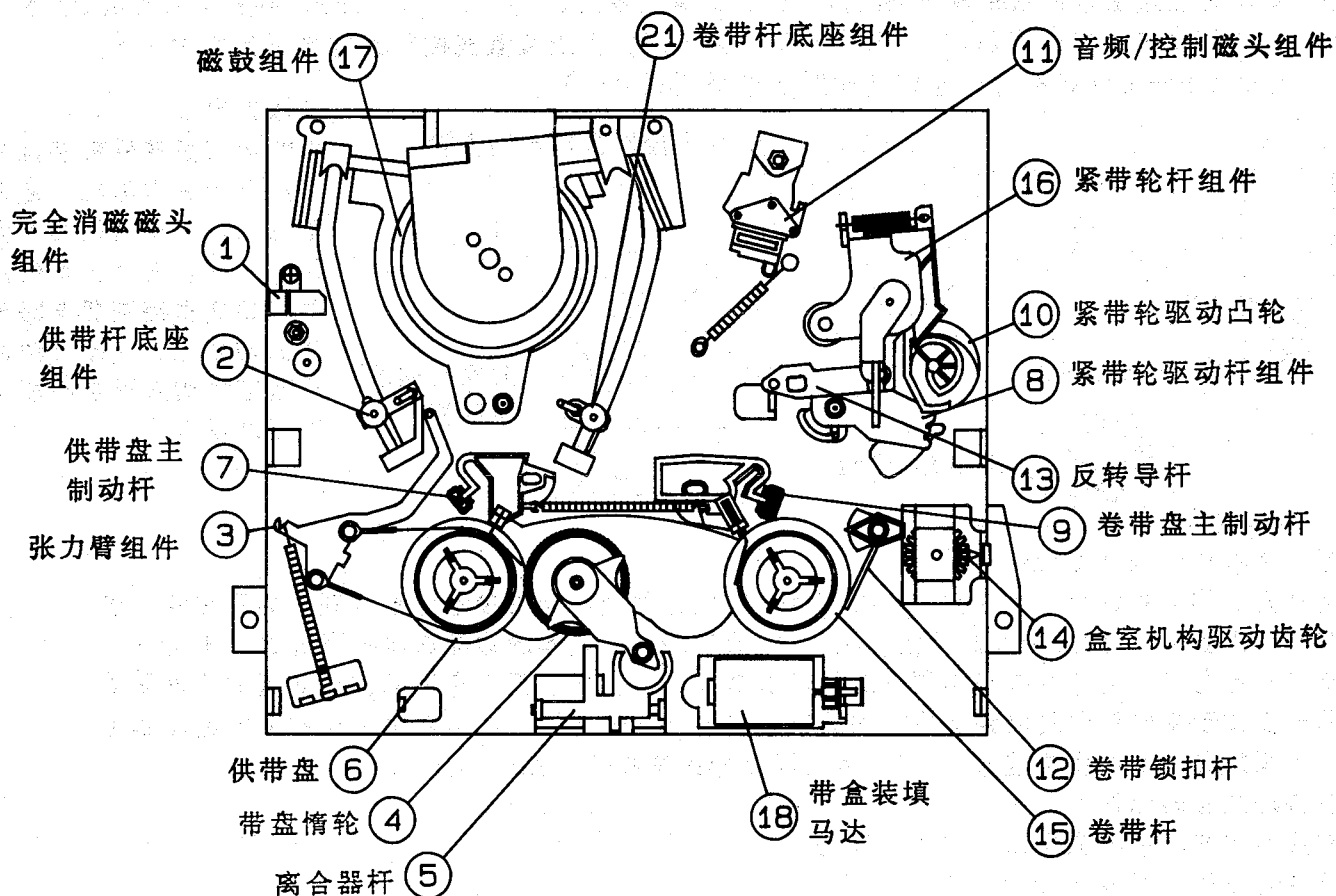
带头感应器、带尾感应器：D804、D803

录象功能触点开关：S812

盒室机构与主电路印刷电路板间的MC-AE插接器（板间插接器）也应加以特别注意。

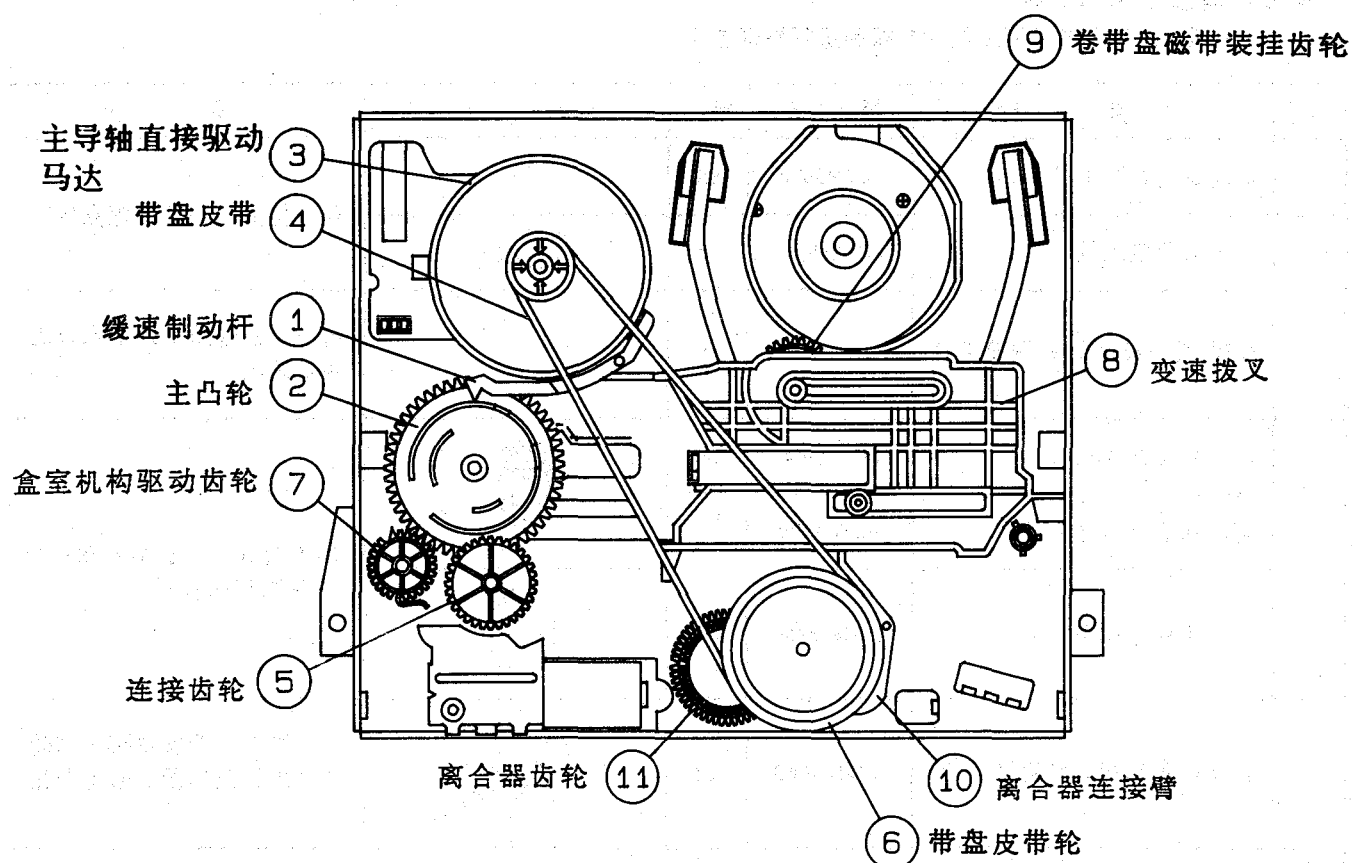


### 3. 主要机械部件的配置(俯视)及其功能



序号	功 能	序号	功 能
1.	完全消磁磁头组件 于录象工作状态时消去录象磁带的全部记录内容。	13.	反转导杆 于视频搜索倒带状态时，拉挂磁带，并且通过其高导杆和低导杆控制其走带高度。
3.	张力臂组件 检测走带时录象磁带的松紧程度，并与张力带一道对供带盘产生制动作用。	16.	紧带轮杆组件 于走带状态中，压紧磁带于主导轴。于磁带出盒动作时，其右侧突出部拨动磁带盒室控制组件离合器，使其机构将带盒推出盒室。
7.	供带盘主制动 于录象机动作停止时以及录象机处快进或倒带状态时，对供带盘产生制动作用，以防止磁带的松弛。	18.	带盒装填马达 其马达之作用在于为填装机构提供带盒填入及磁带装挂的动力。其动力通过马达皮带的传动，转为主凸轮及磁带盒室控制机构的动作。
9.	卷带盘主制动 于录象机动作停止时以及录象机处快进或倒带状态时，对卷带盘产生制动作用，以防止磁带的松弛。		

### 主要机械部件的配置(仰视)及其功能



序号	功 能	序号	功 能
1.	<p>缓速制动器</p> <p>于缓速静止状态时, 其制动器相触于与主凸轮连动的主导轴, 对其轴产生适当的制动作用。</p>	6.	<p>带盘皮带轮</p> <p>将主导轴直接驱动马达的动力经带盘惰轮传送给带盘。</p>
3.	<p>主导轴直接驱动马达</p> <p>提供走带所需动力。其动力的转换由带盘皮带实现。</p>	8.	<p>变速拨叉</p> <p>将主凸轮的运动传输至制动器齿轮与带盒装填齿轮。</p>
4.	<p>带盘皮带</p> <p>带动带盘皮带轮转动, 以驱动磁带的运转。</p>	9.	<p>卷带盘磁带装挂齿轮</p> <p>通过磁带装挂继动齿轮, 移动卷带杆底座及导辊, 并将磁带环绕于磁鼓。另外, 其齿轮还有传动力于供带盘磁带装挂齿轮之作用。</p>

## 4 机械部件的调整、更换及装配

这里我们将为您介绍一些较简单的保养调试方法。这些方法与需要特殊的仪器和工具的复杂检修(例如,磁鼓的组装或更换等)相比更为容易简单。

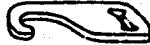
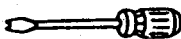

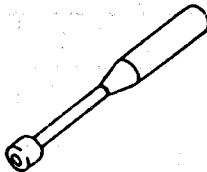

我们相信,下表所列便于使用的工具在您为本录象机作定期保养以维持其原有的工作状态下无疑能起很大的作用。

### 机械部件调整必需的工具

检查修理时,应准备下列工具才能顺利进行修理工作。

序号	工具名称	零件编号	编码	形状	备注
1	带盘高度调整工具	JiGRH0002	BR		用于检查、调整带盘高度。
2	主平面调整工具	JiGMP0001	BY		
3	音频/控制磁头倾斜调整工具	JiGACH-A323U	BX		用于设定音频/控制磁头的倾斜角度。
4	转矩测量计(90克)	JiGTG0090	CM		用于检查、调整供带轮和卷带轮的转动力矩。
	转矩测量计(1.2公斤)	JiGTG1200	CN		
5	转矩测量计测头	JiGTH0006	AW		
6	盒匣磁带式转矩测量计	JiGVHT-063	CZ		用于检查、调整卷带轮的转动力矩以及测量磁带反向张力。
7	张力测量计(300克)	JiGSG0300	BF		分为300克和2.0公斤两量级,用于张力测量。
	张力测量计(2.0公斤)	JiGSG2000	BS		
8	六角扳手(0.9毫米)	JiGHW0009	AE		用于松弛或紧固特制六角螺栓。
	六角扳手(1.2毫米)	JiGHW0012	AE		
	六角扳手(1.5毫米)	JiGHW0015	AE		
9	校正用磁带(PAL制式)	VR0CPSV	CK		专用于机器的电路微调。



序号	工 具 名 称	零件编号	编号	形 状	备 注
11	张力测量计接续器	JiGADP003	BK		用于张力测量计。
12	专用螺丝刀	JiGDRIVERH-4	AP		用于导辊高度调整。
14	扭转改锥（5 公斤）	JiGTD1200	CB		用于扭转树脂制工具。标准扭转值为 5 公斤。
15	套管改锥	JiGDRIVER110-7	AS		用于音频/控制磁头高度和 X 位置的调整。
		JiGDRIVER110-4	AV		用于定位导杆的高度调整。
17	反转导杆高度调整工具	JiGRVGH-F18	BU		用于反转导杆的高度调整。

## 机械部件的定期保养期间

为保持机械部件的正常工作性能，务必按下表定期进行维护保养。

部件名称	保养间隔	每500 小时	每1000 小时	每1500 小时	每2000 小时	可能出现症状	备 注
导辊组件		□	□	□	○	水平噪音线出现， 磁头不时被磁带缠 绞。	如发生不正常的旋转或 显著的摇摆，就需更换 该部件。
供带阻抗滚子		□	□	□	○		
供带阻抗滚子(内侧)			□		□		
供带阻抗滚法兰		□	□	□	□		用指定清洁剂擦拭与磁 带接触部份。
定位导杆		□	□	□	□		
斜杆		□	□	□	○		
磁鼓组件		□	○□	□	○□	信号/噪声比过小,无彩色表现。 装入校正用磁带时,包络线非 平坦。	用指定清洁剂擦拭与磁 带接触部份。
完全消磁磁头		□	□	□	○	色彩过淡，图象闪跳。	
音频/控制磁头		□	□	□	○	声音太小或者噪音太大。	
主导轴直接驱动马达		□	□	□	○	磁带不转，色彩不均。	
紧带轮		□	□	□	○	不走带，磁带松弛。	用指定清洁剂擦拭橡胶 与橡胶接触部份。
带盘皮带			□		○	不走带，磁带松弛，快进或倒带 时走带不正常。	
张力带组件					○	带盒不填入或不退出。	
装填马达					○		
带盘惰轮组件					○	不走带。	
带盘皮带轮组件			□△		□○		
离合器齿轮组件					○		
供带/卷带主制动杆					○	磁带松弛。	

注意：○：部件更换

□：部件清洗(用不起毛的绸布蘸异丙醇擦拭)

△：部件注油(注有标记之部件应该每1000小时用高级轴油点注润滑)

如发现所测数值超过或不及规定范围，务必对该部件进行清洗或加以更换。

## 磁带盒室控制机构的拆卸及安装

### ● 盒室控制机构的拆卸

1. 退出磁带盒匣，设机构于出盒状态。
2. 从电源插座中拔出电源引线插头。
3. 按下述步骤的要求顺序进行拆卸。
- a) 松去紧固磁带盒室控制机构的紧固螺丝(1)和(2)。
- b) 按箭头方向移动磁带盒室机构，然后将其向上拉出。

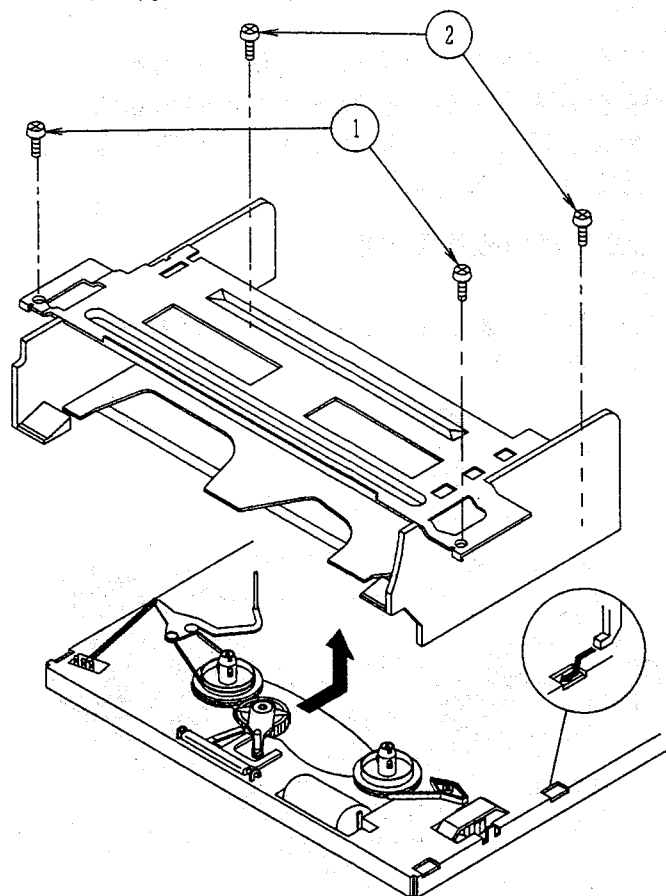


图4-1

### ● 盒室控制机构的组装

1. 安装盒室机构前，先用22Ω电阻短接主印刷电路板左侧的TP5001（或跨接销241）和TP5002（或跨接销242）之间。然后，插入电源引线插头，盒室控制机构驱动齿轮开始转动。机芯底盘窗口处正好出现标记时转动停止。按图4-2所示，通过盒室控制机构驱动齿轮的转角对底盘窗口处出现的标记位置进行调整。

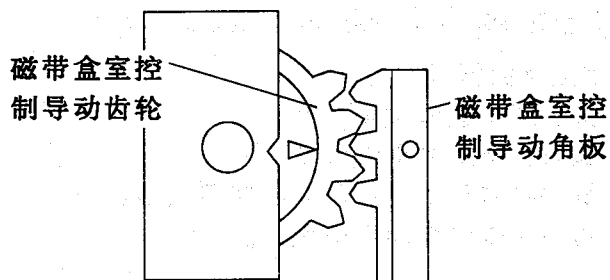


图4-2

2. 按拆卸步骤的相反顺序进行组装。

### 注意：

- ① 拆卸或组装时，如使用带磁螺丝刀，务请注意不要让其触碰音频/控制(A/C)磁头、完全消磁(FE)磁头以及磁鼓。
- ② 拆卸或组装磁带盒室控制机构时，务请谨慎小心，切勿磕碰其机构，同时注意不要让工具等碰撞导向销、磁鼓等精密度较高的部件。
- ③ 组装之后，填装一录象带盒于盒室控制机构中。

## 无盒室控制机构的走带测试

1. 电源接通之前，先用22Ω电阻短接主印刷电路板左侧的TP5001（或跨接销241）和TP5002（或跨接销242）之间。
2. 插电源引线插头于电源插座。
3. 开启电源开关。
4. 用手打开磁带盒匣端口之盖。
5. 用胶带张贴之以保持其开盖状态。
6. 置其于主机芯中的走带机构。
7. 应将500g的重物牢固地安置于录象带盒上。
8. 作磁带的走带测试。

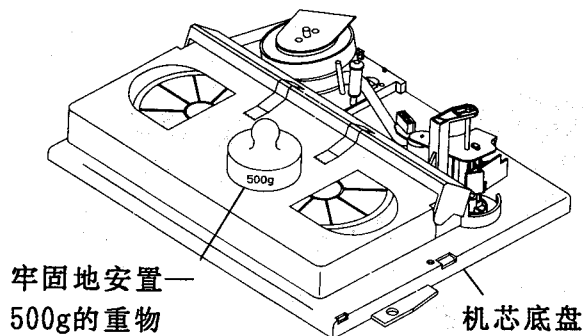


图4-3

注：压其重物不得超过500克。

## 带盘座的拆装与高度

### ●带盘座的拆卸

1. 拆去磁带盒室控制机构。
2. 从张力臂上取出张力带。
3. 拆去供带用主制动器和卷带用主制动器。
4. 拆去供带盘座和卷带盘座。

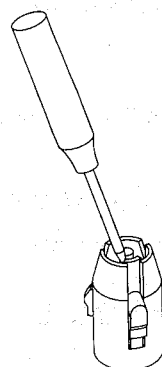
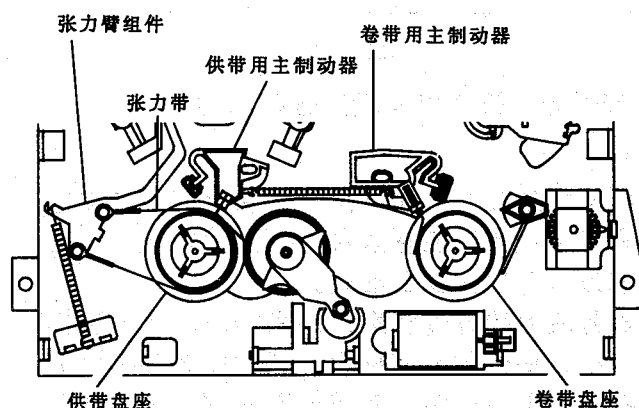


图4-4

### 注意：

拆卸时，应按图中箭头所示方面按压张力带，以免使锁扣变形。



图4-5

### ●供带盘座的更换

1. 清擦供带盘座轴，并注油加以润滑。
2. 将准备好的新供带盘座插套入其轴。
3. 环张力带于供带盘座装置安置就位，并将其端插入张力臂之插孔。
4. 检查供带盘座的高度后，安置供带用主制动器就位。

### 注意：

- ①安置供带盘座时，务请格外小心，切勿弯折扭曲张力带。
- ②切勿碰伤供带用主制动器。

### ●卷带盘座的更换

1. 清擦卷带盘座轴，并注油加以润滑。
2. 将准备好的新卷带盘座插套入其轴。
3. 检查卷带盘座的高度后，安置卷带用主制动器就位。

### 注意：

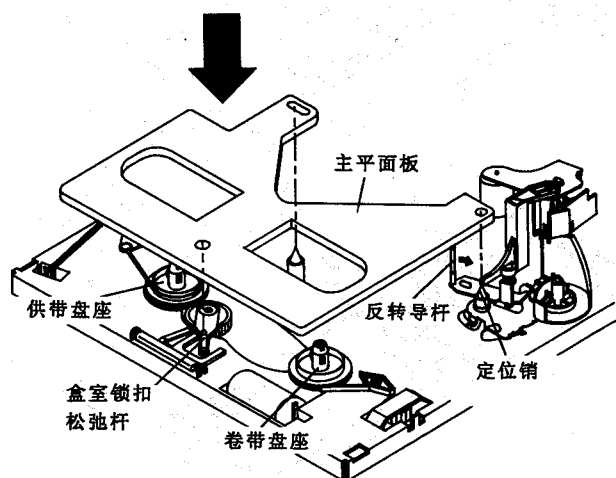
务请小心谨慎，切勿碰伤卷带用主制动器。

\*带盘座更换之后，须检查调试视频搜索倒带时的反向张力（见第75页），以及其制动力矩（见第78页）。

### ●带盘高度的检测和调整

### 注意：

将主面板设置于主机芯，注意切勿磕碰磁鼓（见图4-6所示）。



用手指松开反转导杆，使主面板设置。

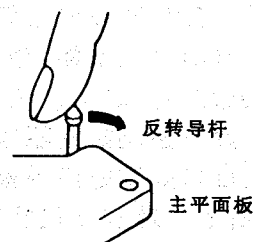


图4-6

- 检查带盘座是否低于图示A位置而高于B位置。如果所测高度不在AB两位置的要求范围内，则通过更换带盘座下面的滑动垫圈对其高度进行调整。

**注意：**  
带盘座只要一经更换，就必须对其进行高度的检测和调整。

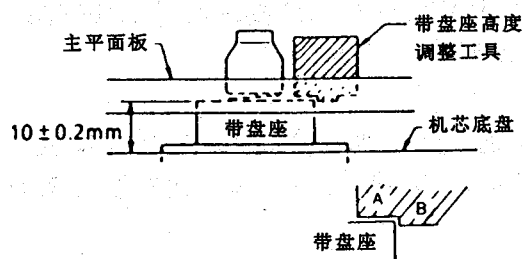


图4-7

### 快进状态时卷带转矩的检测和调整

#### ●拆去磁带盒室控制机构

●电源接通之前，先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

#### ●转矩测量计的设置

1. 设转矩测量计的刻度于0，然后将其转矩测量计安置于卷带盘座上。
2. 触按快进(FF)键，置盒室控制机构于快进状态。

#### ●快进转矩的检测

1. 用手缓慢地沿卷带方向旋转转矩测量计(2~3秒/转)。
2. 检查所测卷带转矩值是否大于 $69\text{mN}\cdot\text{m}$ ( $700\text{gf}\cdot\text{cm}$ )。

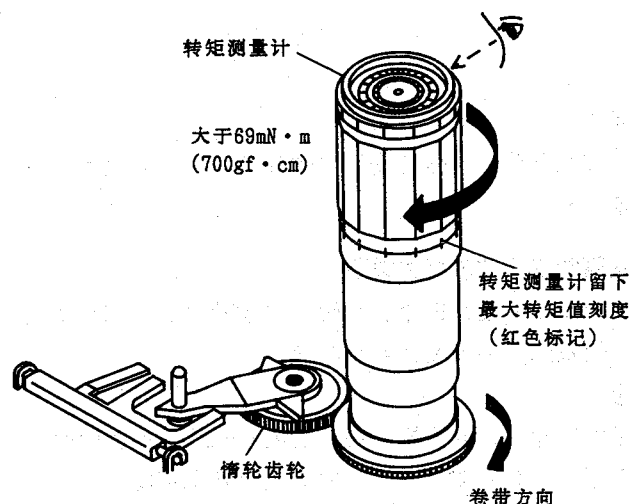


图4-8

#### ●快进转矩的调整

1. 如果所测快进卷带转矩超出或不及规定值范围，则需用清洗液清擦主导轴直接驱动马达皮带轮，带盘皮带及其皮带轮。然后，再测量之。

2. 如果清擦后所测快进卷带转矩仍不符规定要求，则需更换带盘皮带。

#### 注意：

1. 设置及计测时，须用手向下按住转矩测量计，以免卷带盘的旋转甩飞安置于其上的转矩测量计。
2. 作卷带转矩检测时，不宜让带盘座锁扣时间过长。

### 倒带状态时卷带转矩的检测和调整

#### ●拆去磁带盒室控制机构

●电源接通之前，先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

#### ●转矩测量计的设置

1. 设转矩测量计的刻度于0，然后将其转矩测量计安置于卷带盘座上。
2. 触按快进(FF)键，置盒室控制机构于快进状态。

#### ●倒带转矩的检测

1. 用手缓慢地沿卷带方向旋转转矩测量计(2~3秒/转)。
2. 检查所测卷带转矩值是否大于 $69\text{mN}\cdot\text{m}$ ( $700\text{gf}\cdot\text{cm}$ )。

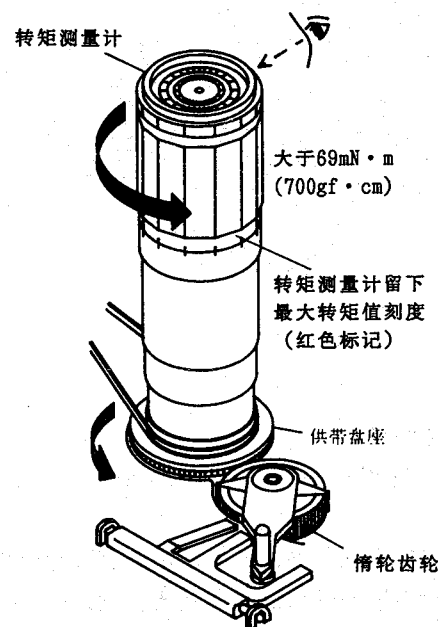


图4-9

#### ●倒带转矩的调整

1. 如果所测快进卷带转矩超出或不及规定值范围，则需用清洗液清擦主导轴直接驱动马达皮带轮，带盘皮带及其皮带轮。然后，再测量之。

2. 如果清擦后所测快进卷带转矩仍不符规定要求, 则需更换带盘皮带。

注意:

1. 设置及计时时, 须用手向下按住转矩测量计, 以免卷带盘的旋转甩飞安置于其上的转矩测量计。
2. 作卷带转矩检测时, 不宜让带盘座锁扣时间过长。

### 再现状态时卷带转矩的检测和调整

1. 拆去磁带盒室控制机构。
2. 电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。
3. 用手揭开盒匣磁带式转矩测量计端口盒盖, 用两片胶带张点之以保持其开盖状态。
4. 填装盒匣磁带式转矩测量计于录象机中。
5. 加一500g的重物于盒匣磁带式转矩测量计上。
6. 触按录象(REC)键, 设录象机于录象状态。

规定值为EP  $8.8 \pm 3.8 \text{ mN} \cdot \text{m}$  ( $90 \pm 39 \text{ gf} \cdot \text{cm}$ )

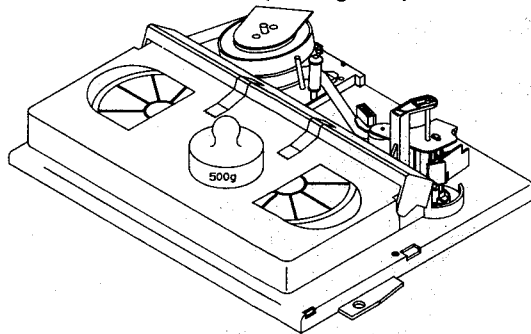


图4-10

#### ●再现卷带转矩的检测

1. 检查所测转矩值是否于 $8.8 \pm 3.8 \text{ mN} \cdot \text{m}$  ( $90 \pm 39 \text{ gf} \cdot \text{cm}$ )。
2. 由于带盘旋转的不均匀性, 所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。
3. 触按录象键(REC), 置录象机为录象状态, 检查这时的卷带转矩是否也满足上述要求。

#### ●再现卷带转矩的调整

如果所测再现卷带转矩超出或不及其规定值范围, 则需更换卷带盘座。

注: 压一重物于测量计之上, 以防其翘起。

### 视频搜索倒带状态时卷带转矩的检测和调整

#### ●拆去磁带盒室控制机构

- 电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

#### ●设置

1. 触按再现(PLAY)键, 设录象机于再现状态。
2. 触按倒带(REW)键, 设录象机于视频搜索倒带状态。

#### ●视频搜索倒带转矩的检测

1. 置转矩测量计于供带盘座之上, 逆时针方向缓慢地旋转之(1~2秒/转), 检查所测转矩值是否于 $14.5 \pm 8 \text{ mN} \cdot \text{m}$  ( $148 \pm 80 \text{ gf} \cdot \text{m}$ )的规定范围内。

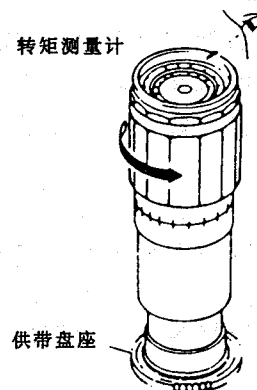


图4-11

注意:

应将转矩测量计牢固地安置于供带盘座之上, 否则, 所测值并非真实。

#### ●视频搜索倒带转矩的调整

如果所测视频搜索倒带状态时的卷带转矩超出或不及其规定值范围, 则需更换卷带盘座。

注意:

由于供带盘旋转的不均匀性, 所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。

## 快进状态时的反向张力的检测

### ●拆去磁带盒室控制机构

●电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ●检测反向张力

1. 触按快进(FF)键, 设录象机于快进状态。
2. 置转矩测量计于供带盘座之上, 顺时针方向缓慢地旋转之(2~3秒/转), 检查所测转矩值是否于 $1.5 \pm 0.9\text{mN} \cdot \text{m}$ ( $15 \pm 9\text{gf} \cdot \text{cm}$ )的规定范围内。

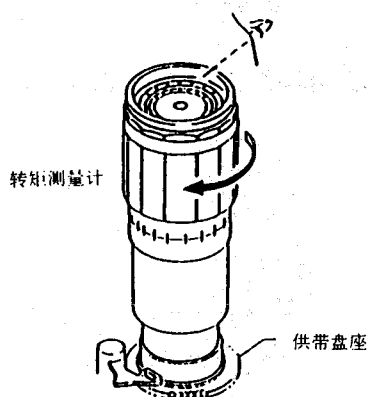


图4-12

### 注意：

- ① 应将转矩测量计牢固地安置于卷带盘座之上, 否则, 所测值并非真实。
- ② 在加负荷于带盘座之状态下, 转矩测量计所示的数值是真实的转矩测量值。

## 倒带状态时反向张力的检测

### ●拆去磁带盒室控制机构

●电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ●检测反向张力

1. 触按倒带(REW)键, 设录象机于倒带状态。

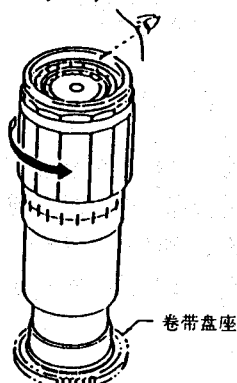


图4-13

2. 置转矩测量计于卷带盘座之上, 逆时针方向缓慢地旋转之(2~3秒/转), 检查所测转矩值是否于 $1.3 \pm 0.8\text{mN} \cdot \text{m}$ ( $10 \pm 5\text{gf} \cdot \text{cm}$ )的规定范围内。

### 注意：

- ① 应将转矩测量计牢固地安置于卷带盘座之上, 否则, 所测值并非真实。
- ② 在加负荷于带盘座之状态下, 转矩测量计所示的数值是真实的转矩测量值。

## 视频搜索倒带状态时反向张力的检测

### ●拆去磁带盒室控制机构

●电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ●检测反向张力

1. 触按再现(PLAY)键, 设录象机于再现实态。
2. 触按倒带(REW)键, 设录象机于视频搜索倒带状态。
3. 置转矩测量计于卷带盘座之上, 逆时针方向缓慢地旋转之(2~3秒/转), 检查所测转矩值是否于 $4 \pm 1.7\text{mN} \cdot \text{m}$ ( $41 \pm 17\text{gf} \cdot \text{m}$ )的规定范围内。

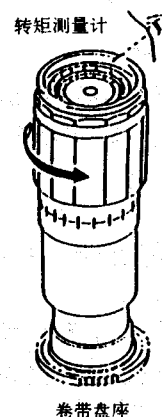


图4-14

### 注意：

- ① 应将转矩测量计牢固地安置于卷带盘座之上, 否则, 所测值并非真实。
- ② 在不加负荷于带盘座之状态下, 测定之。

## 紧带轮紧带压力的检测

### ●拆去磁带盒室控制机构

●电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ●检测

触按再现(PLAY)键, 设录象机于再现实态。

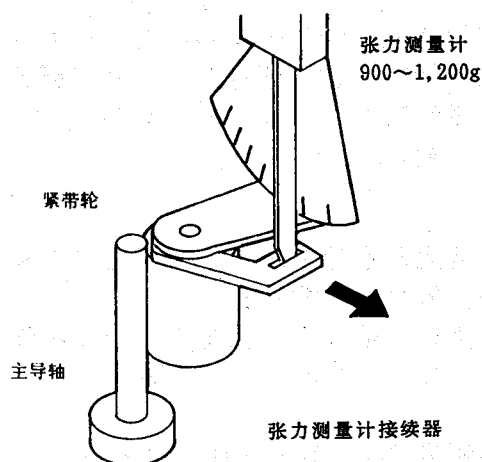


图4-15

1. 用一手指拨移紧带轮，使之与主导轴分离。
2. 通过套挂张力测量计接续器将张力测量计设置于紧带轮轴之上。
3. 慢慢放松施于手指的压力，让紧带轮渐渐靠拢主导轴。在紧带轮与主导轴相触的瞬间，测量计上的读数就是所要计测的压力值。
4. 检查所测压力值是否在900~1,200g的规定范围内。

### 张力杆位置的检测和调整

#### ● 拆去磁带盒室控制机构

- 电源接通之前，先用22Ω电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

#### ● 设置

1. 揭开录象带(E-180)盒盖，用两片胶带将开盖固定。
2. 装入开盖的录象带带盒于盒室机构。
3. 在录象带带盒上加500g的重物。

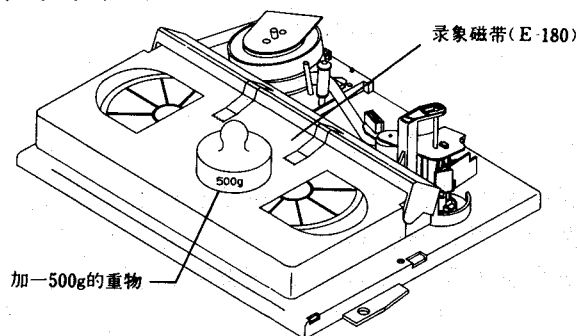


图4-16

#### ● 调整

1. 安置好录象带带盒，触按录象(REC)键，让挂带机构挂好磁带后，检查张力杆的位置。

2. 通过观察检查张力杆左端是否位于与SI辊中心线左端离开0.2mm之位置。其重调方法如下：

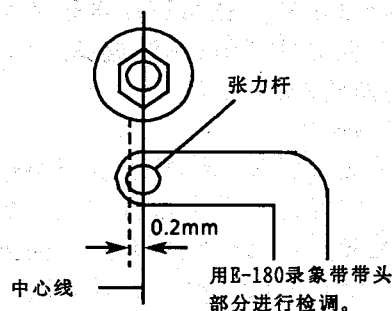


图4-17

- ① 张力杆左端偏移至虚线的左侧时：

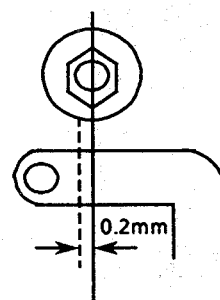


图4-18

1. 取出录象带带盒，触按录象(REC)键，让挂带机构作无带装挂动作。插一字口螺丝刀于张力带定位凸轮，顺时针旋转之。
2. 装入录象带带盒，再检查张力杆的位置。

- ② 张力杆左端偏移至虚线的右侧时：

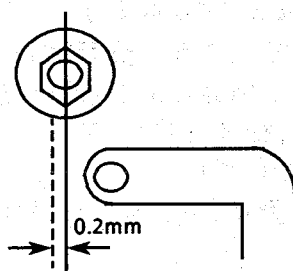


图4-19

1. 取出录象带带盒，触按录象(REC)键，让挂带机构作无带装挂动作。插一字口螺丝刀于张力带定位凸轮，逆时针旋转之。
2. 装入录象带带盒，再检查张力杆的位置。



注意：

- ① 张力带定位凸轮位于录象带带盒之下，因此上述的调整不能在带盒着位状态下进行。上述调整为下述步骤的重复：作无带装挂动作，调节，装入带盒，检查位置。
- ② 右移张力杆时，顺时针（下图黑色箭头方向）旋转定位凸轮。左移张力杆时，逆时针（下图白色箭头方向）旋转定位凸轮。

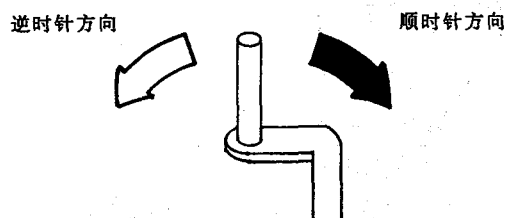


图4-20

### ③ 张力杆定位凸轮的调整范围

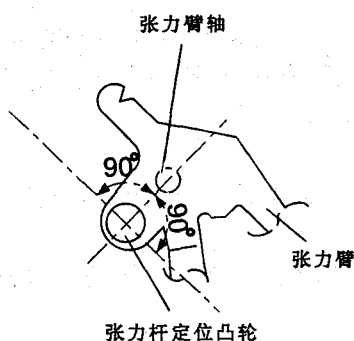


图4-21

以张力臂轴中心至定位凸轮中心为轴的左右90°范围内调整张力杆定位凸轮。

## 录象/再现状态时反向张力的检测和调整

### ● 拆去磁带盒室控制机构

- 电源接通之前，先用22Ω电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ● 设置

1. 揭开录象带转矩计盒盖，用两片胶带将开盖固定。
2. 装入开盖的录象带转矩计于盒室机构。
3. 在转矩计盒体上加500g重物。

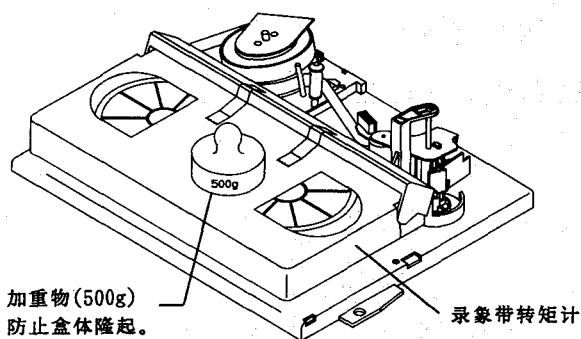


图4-22

### ● 反向张力的检测

1. 触按录象(REC)键，设录象机于录象状态。
2. 检查所测反张力值是否在32~38g·cm的规定范围内。

注意：

1. 确认走带时，不发生磁带高出定位导杆的现象。
2. 确认磁带自始至终不发生松弛或损伤现象。

### ● 反向张力的调整

1. 录象带转矩计所测读数小于规定值时，向A方向移动张力弹簧。
2. 录象带转矩计所测读数大于规定值时，向B方向移动张力弹簧。

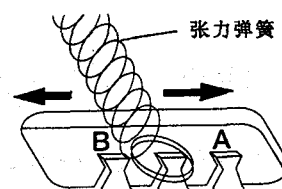
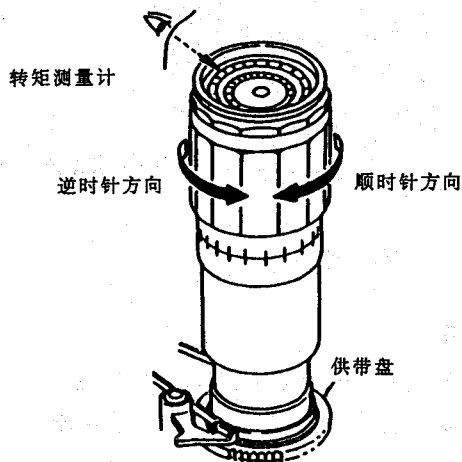


图4-23

## 制动力矩的检测

### ● 供带侧制动力矩的检测



逆时针方向： $10 \pm 4\text{mN} \cdot \text{m}(102 \pm 41\text{gf} \cdot \text{cm})$   
顺时针方向： $35 \pm 20\text{mN} \cdot \text{m}(357 \pm 204\text{gf} \cdot \text{cm})$

图4-24

#### 1. 拆去磁带盒室控制机构。

- 电源接通之前，先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

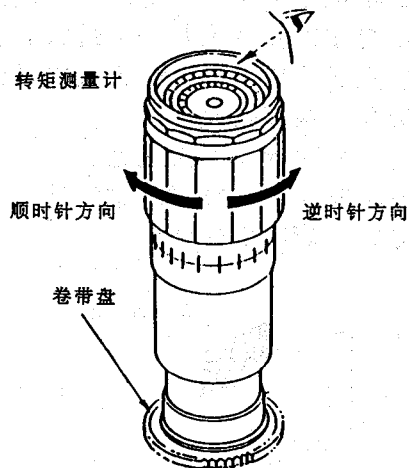
#### 设定方法

1. 设转矩测量计的刻度于0，置其于供带盘座之上。
2. 转换快进(FF)状态为停止(STOP)状态。

### ● 检测方法

1. 用手缓慢地沿供带制动的顺时针方向和逆时针方向旋转转矩测量计，使转矩测量计的刻度盘与供带盘以同样的转速旋转。然后，检查所测值是否满足其规定要求：顺时针方向制动力矩= $35 \pm 20\text{mN} \cdot \text{m}(357 \pm 204\text{gf} \cdot \text{cm})$ ；逆时针方向制动力矩= $10 \pm 4\text{mN} \cdot \text{m}(102 \pm 41\text{gf} \cdot \text{cm})$ 。另外，两者所测值还得满足顺时针方向制动力矩至少等于逆时针方向制动力矩的两倍之规定要求。

### ● 卷带侧制动力矩的检测



逆时针方向： $35 \pm 20\text{mN} \cdot \text{m}(357 \pm 204\text{gf} \cdot \text{cm})$   
顺时针方向： $10 \pm 4\text{mN} \cdot \text{m}(102 \pm 41\text{gf} \cdot \text{cm})$

图4-25

#### 1. 拆去磁带盒室控制机构。

- 电源接通之前，先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。

### ● 设定方法

1. 设转矩测量计的刻度于0，置其于卷带盘座之上。
2. 转换快进(FF)状态为停止(STOP)状态。

### ● 检测方法

1. 用手缓慢地沿卷带制动的顺时针方向和逆时针方向旋转转矩测量计，使转矩测量计的刻度盘与卷带盘以同样的转速旋转。然后，检查所测值是否满足其规定要求：逆时针方向制动力矩= $35 \pm 20\text{mN} \cdot \text{m}(357 \pm 204\text{gf} \cdot \text{cm})$ ；顺时针方向制动力矩= $10 \pm 4\text{mN} \cdot \text{m}(102 \pm 41\text{gf} \cdot \text{cm})$ 。另外，两者所测值还得满足逆时针方向制动力矩至少等于顺时针方向制动力矩的两倍之规定要求。

### ● 供带侧以及卷带侧制动力矩的调整

1. 如果供带侧或卷带侧制动力矩所测值不满足其规定要求，则应清擦供带盘座或卷带盘座制动杆及其垫圈，然后重新检测之。
2. 如果清擦后重测制动力矩仍不符规定要求，则需更换主制动器或主制动弹簧。

#### 注意：

主制动器一经更换，则需进行高度的检测与调整(见第72页所述)，以及制动力矩的检测。

## 音频/控制(A/C)磁头的更换

1. 拆去磁带盒室控制机构。
2. 设录象机于出盒状态后, 拔去其电源引线插头。

### ● A/C磁头的拆卸

1. 松旋倾斜度调整螺丝①。
2. 松去方位角调整螺丝②。
3. 松去A/C磁头螺丝③。
4. 松焊A/C磁头印刷电路板与A/C磁头的连线。

注意:

1. 拆装更换后, 必须进行磁带走行检查调整(见第81页所述)。拆装过程中, 无论是什么情况, 都不得用手或他物触碰A/C磁头。
2. 松去A/C磁头螺丝时, 注意防止其方位弹簧弹出遗失。

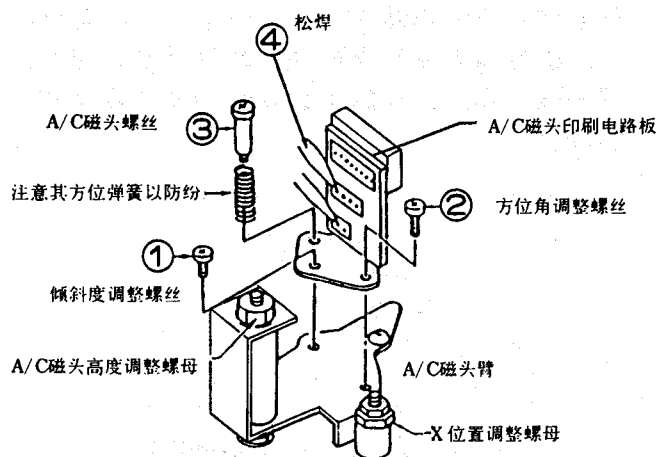


图4-26

### ● A/C磁头的更换

1. 焊接拆卸下的A/C磁头印刷电路板与更换用新A/C磁头的连线。
2. 安置A/C磁头组件, 使A/C磁头臂与A/C磁头基板大致上相互平行。

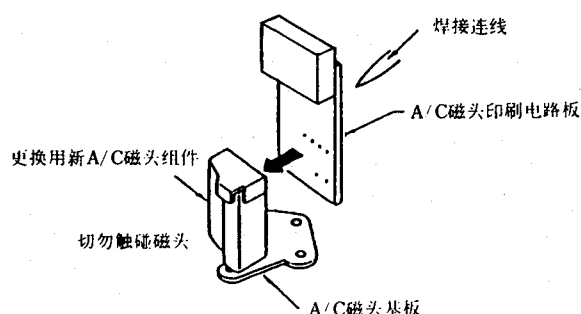


图4-27

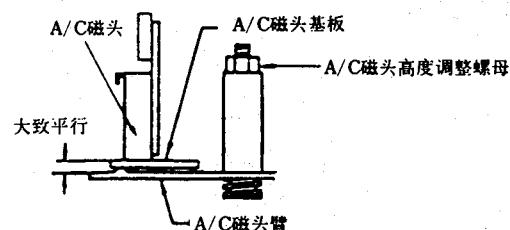


图4-28

### ● A/C磁头的调整

#### (A/C磁头的倾斜度调整)

1. 设录象机于带盒装填状态。
2. 设置A/C磁头倾斜度调整工具①就位。
3. 用一螺丝刀缓慢地转动倾斜度调整螺丝②, 直至A/C磁头与A/C磁头倾斜度调整工具间的间隙完全消去为止。

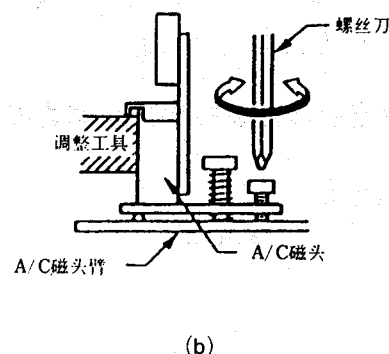
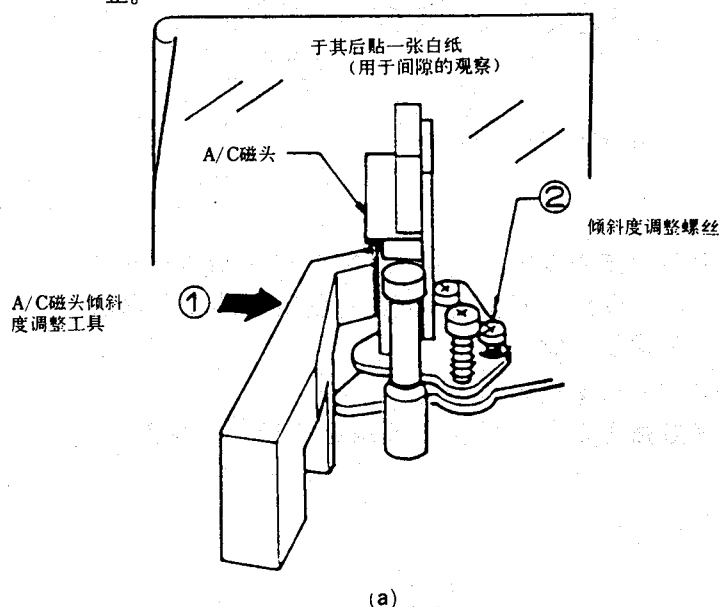
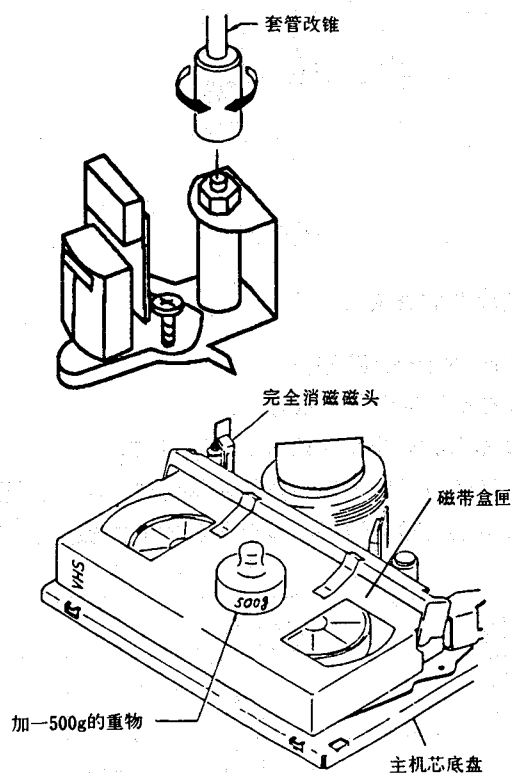


图4-29

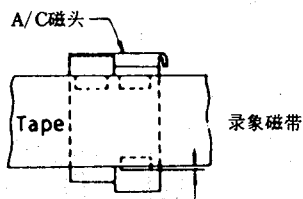
## 〔A/C磁头的高度粗调〕

### ● 设置



- ① 用专用套管改锥旋转A/C磁头高度调整六角螺母，以对其高度进行粗调，使磁带达至下面所示位置为宜。
- ② 装入录象带带盒于盒室机构。
- ③ 触按再现(PLAY)键，设录象机于再现状态。

### ● 调整



旋转高度调整螺母，使控制磁头底边缘低于磁带底边缘  
0.3~0.5mm为宜。

图4-30

## 反转导杆的高度调整

### 〔反转导杆的高度调整〕

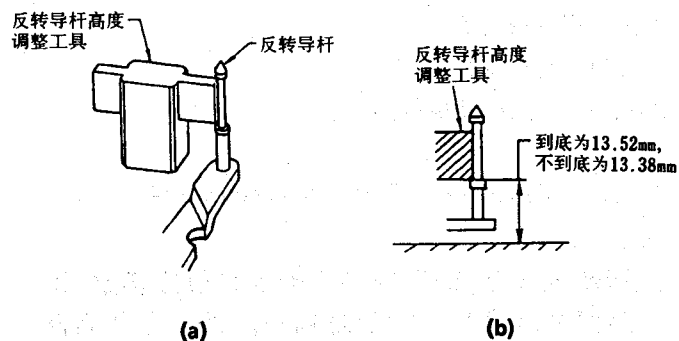


图4-31

1. 先于录象带装挂状态下调整13.38mm端，然后再沿逆时针方向转高度调整36°。
2. 录象带装挂动作结束后，设录象机于再现状态。检查靠近反转导杆处的录象带是否皱折。
3. 用一般市场上贩卖的套管改锥转动高度调整螺母。

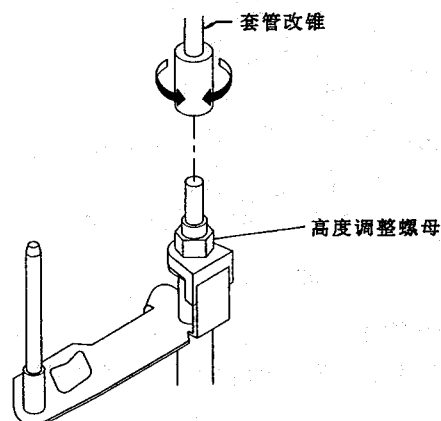


图4-32

## 磁带走行情况的调整

1. 拆去磁带盒室控制机构。
2. 电源接通之前, 先用 $22\Omega$ 电阻短接主印刷电路板左侧的TP5001(或跨接销241)和TP5002(或跨接销242)之间。
3. 检测调整张力杆的位置。(见第76页)
4. 检测调整视频搜索状态时的反向张力。(见第75页)
5. 设定调整A/C磁头倾斜度。(见第79页)
6. 按下述步骤对磁带走行情况进行粗调。

- a) 连接示波器于再现色彩包络线输出(TP203)试点。  
设示波器同步性于外接。这样, 再现色彩信号便会被磁头转换脉冲(TP201)所触发。
- b) 先松开导辊底部的设定螺丝, 然后再用导辊调整专用螺丝刀(JIGDRIVERH-4) 稍微将其旋至能轻松圆滑地转动它之程度。(见图4-33)
- c) 将校正用磁带(单象管图案)盒匣安置于带盘座上, 然后, 将录象机设定于再现状态。  
(施加一500g的重物于带盒之上, 以防走带时带盒的翘起)。

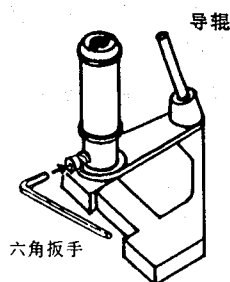


图 4-33

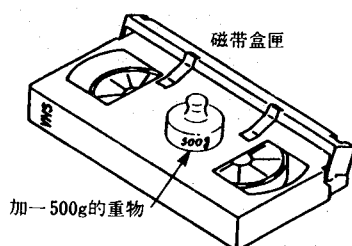
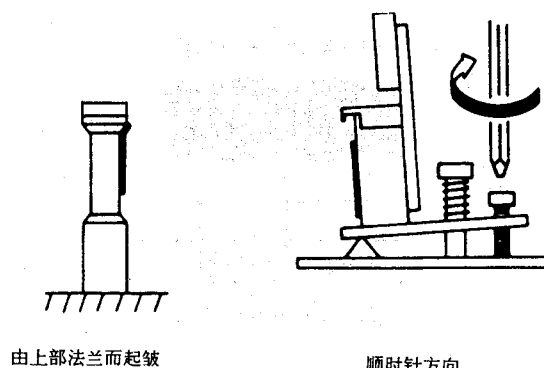


图 4-34

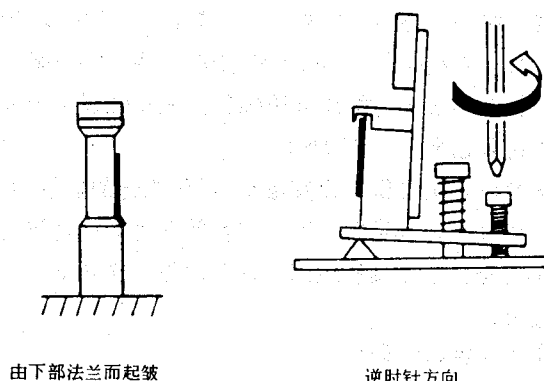
- d) 于X位置调整状态(见电路调整有关章节所述), 触按跟踪键(+ )和(-), 调输出包络线波形从最大至最小, 以及从最小至最大。同时观察其波形是否达至平坦状态。

- e) 如通过上述调节, 其输出包络线波形无法达至平坦状态, 则需用导辊调整用螺丝刀, 对供带侧和卷带侧的导辊进行粗调, 直至输出包络线波形达至平坦。
- f) 用螺丝刀旋转A/C磁头倾斜度调整螺丝而进行A/C磁头倾斜度的调整, 以防由上部与下部法兰在磁带上起皱。

- 1) 由上部法兰起皱时: 如下图4-35 (a)所示那样顺时针方向旋转倾斜度调整螺丝而进行调整。
- 2) 由下部法兰起皱时: 如下图4-35 (b)所示那样逆时针方向旋转倾斜度调整螺丝而进行调整。



(a)



(b)

图 4-35

### 注意:

1. 将跟踪调节控制钮设定于其中间位置, 然后调整X位置调整螺母, 使再现色彩包络线波形达其最大, 以便进行磁带走行情况的粗调。
2. 粗调过程中, 应特别注意对其输出波形等的观察。



图 4-36

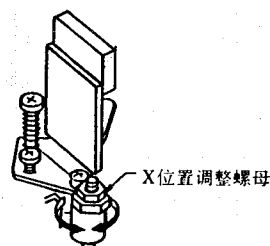


图 4-37

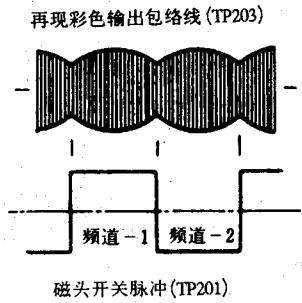


图 4-38

7. A/C磁头高度和方位角的调整

- a) 连接示波器于音频输出端。
- b) 装入校正用磁带、再现之，让其输出 6 kHz 的音频信号（其视频信号为单象管图形）。用十字口螺丝刀旋转 A/C 磁头方位角调整螺丝，使示波器上音频输出达其最大。（见图 4-39）。
- c) 再现校正用磁带，让其输出 1kHz 的音频信号（其视频信号为彩条图形）。用专用套管改锥缓慢地旋转 A/C 磁头高度调整螺母，使示波器上音频输出达其最大。
- d) 重复步骤 b) 的调整。
- e) 完成上述步骤后，浇粘合剂 (LOCTITE) 于方位角调整螺丝和高度调整螺母之上，封固之。

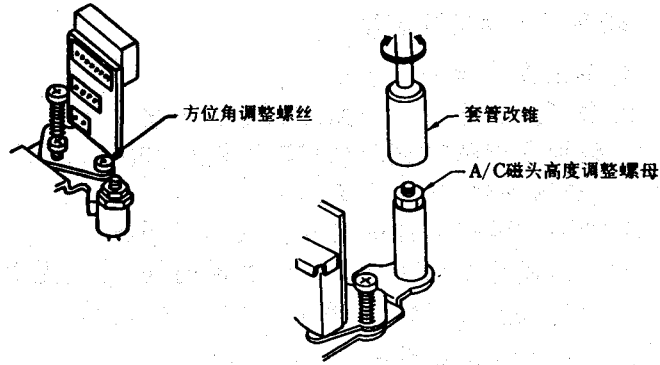


图 4-39

图 4-40

8. 走带系统以及 X 位置的调整。

- a) 连接示波器于试点 TP203，作再现彩色包络线输出。设示波器同步于外接。这样，再现彩色信号将被磁头开关脉冲 (TP201) 所触发。
- b) 再现走带检查用校正磁带。
- c) 触按跟踪键的 (+) 或 (-)，使输出包络线波形从最大转至最小，然后又从最小转为最大。用高度调整用螺丝刀调整供带盘侧和卷带盘侧导辊的高度，使输出包络线尽可能达至平坦。
- d) 如果走行中的磁带低于或高于螺旋扫描导前，再现彩色输出便会呈现图 4-41 所示波形。
- e) 按第 81 页步骤 6 的项目 e) 要求，调节输出包络线的最大平坦度。

	磁带高于螺旋扫描导前		磁带低于螺旋扫描导前	
	供带侧	卷带侧	供带侧	卷带侧
调 整	顺时针方向旋转供带盘侧导辊(导辊降低), 使其输出波形包络线达至平坦。	顺时针方向旋转卷带盘侧导辊(导辊降低), 使其输出波形包络线达至平坦。	逆时针方向旋转供带盘侧导辊(导辊升高), 让磁带高过螺旋扫描导前。然后, 顺时针方向旋转供带盘侧导辊, 使其输出波形包络线达至平坦。	逆时针方向旋转卷带盘侧导辊(导辊升高), 让磁带高过螺旋扫描导前。然后, 顺时针方向旋转卷带盘侧导辊, 使其输出波形包络线达至平坦。

图 4-41

- f) 触按跟踪键的(+)或(-), 检查包络线波形的平坦度反应。
- g) 于磁带卸挂状态, 用导辊设定螺丝紧固导辊。
- h) 再现走带检查用校正磁带, 检查输出包络线波形是否发生变化。

#### 9. A/C磁头X位置的调整

- a) 在X位置的调整状态下, 用 $22\Omega$ 电阻短接主电路印刷电路板左侧的TP5001 (或跨接销241) 和TP5002 (或跨接销242) 之间, 使跟踪控制处于中央位置。
- b) 用螺丝刀旋转A/C磁头X位置调整螺母, 以调整A/C磁头X位置, 以得磁头开关脉冲下侧的最大包络线。
- c) 调整再现转换点。
- d) 再现一录象磁带, 检查输出包络线波形以及声音的平坦度是否满足要求。

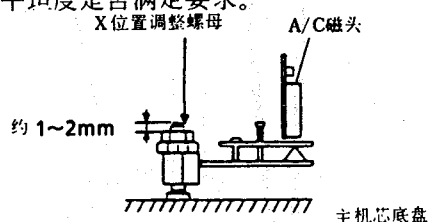


图4-42

### 主导轴直接驱动马达的拆卸和组装

1. 拆去磁带盒室控制机构。

#### ●直接驱动马达的拆卸(按图中所示顺号进行)

1. 拨开主电路印刷电路板上的板间插接器的连接。
2. 拆去带盘皮带(1)。
3. 松去三支紧固螺丝(2)

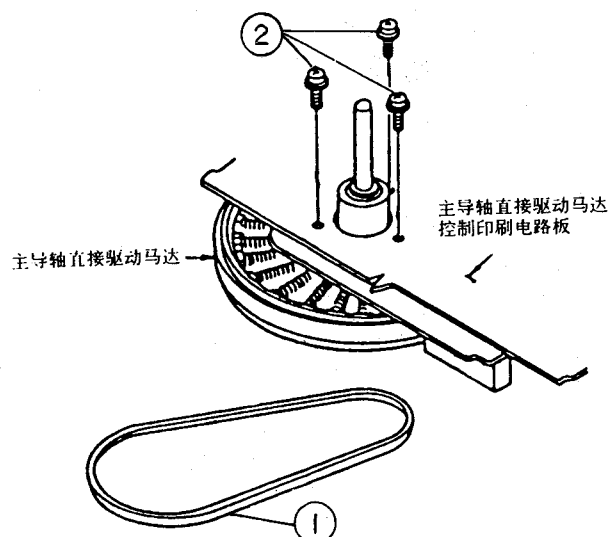


图4-43

#### ●直接驱动马达的组装

1. 将主导轴直接驱动马达就位于主机芯底盘。这时, 应注意不要让主导轴磕碰主机芯底盘。然后, 用三支螺丝将其紧固。
2. 套好带盘皮带。连接好主电路印刷电路板上的板间插接器。

#### 注意:

1. 组装完毕, 转动主导轴直接驱动马达, 检查其转动是否圆滑。
2. 检测, 调整其伺服电路。

## 需要进行下述配相调整的 机械部件的组装

1. 组装紧带轮和紧带轮传动凸轮。（于机芯底盘前面）
2. 安装移行器。（于机芯底盘背面）
3. 安装主凸轮。（于机芯底盘背面）
4. 安装连接齿轮，慢放制动器以及磁带装挂马达。（于机芯底盘背面）

### 1. 紧带轮与紧带轮传动凸轮（机芯底盘前面）的组装

按下图所示数字的顺序进行组装。

- 1 紧带轮传动凸轮
- 2 紧带轮和紧带双动杆
- 3 开盖柄

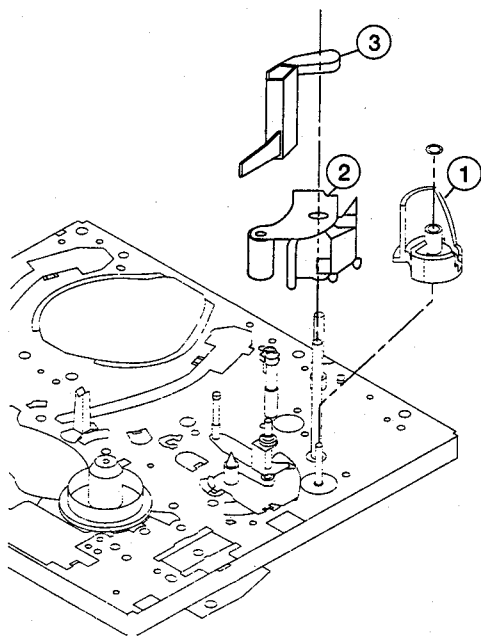
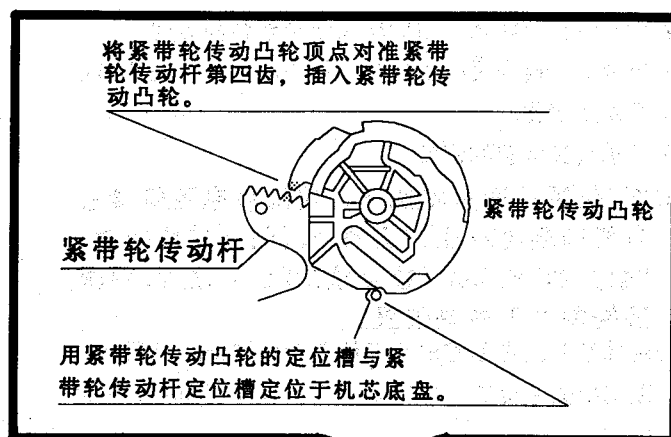


图4-44

### ① 插入紧带轮传动凸轮



配相点①

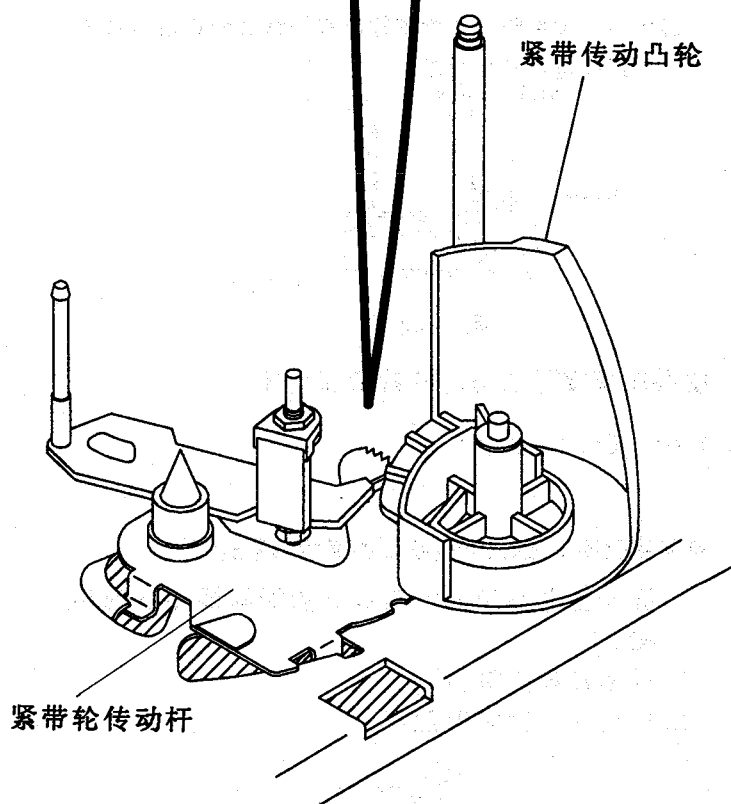
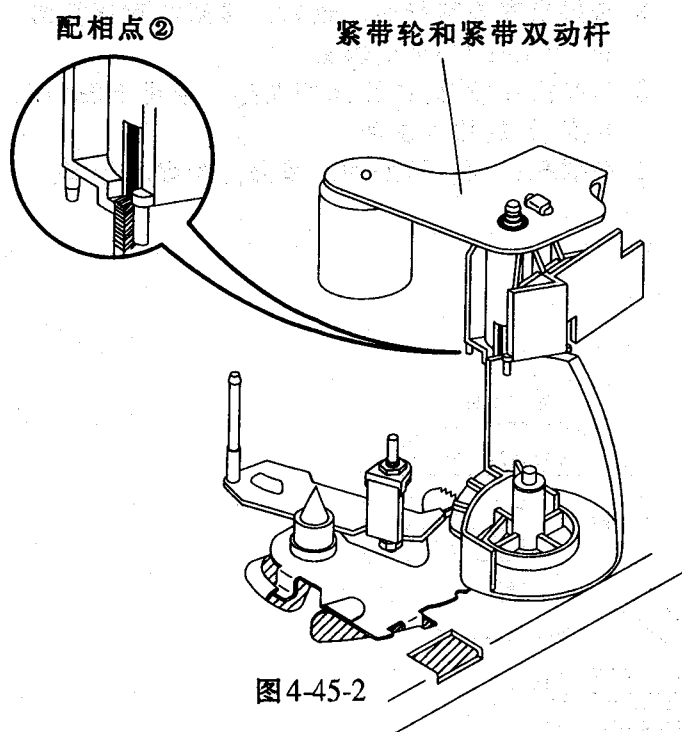


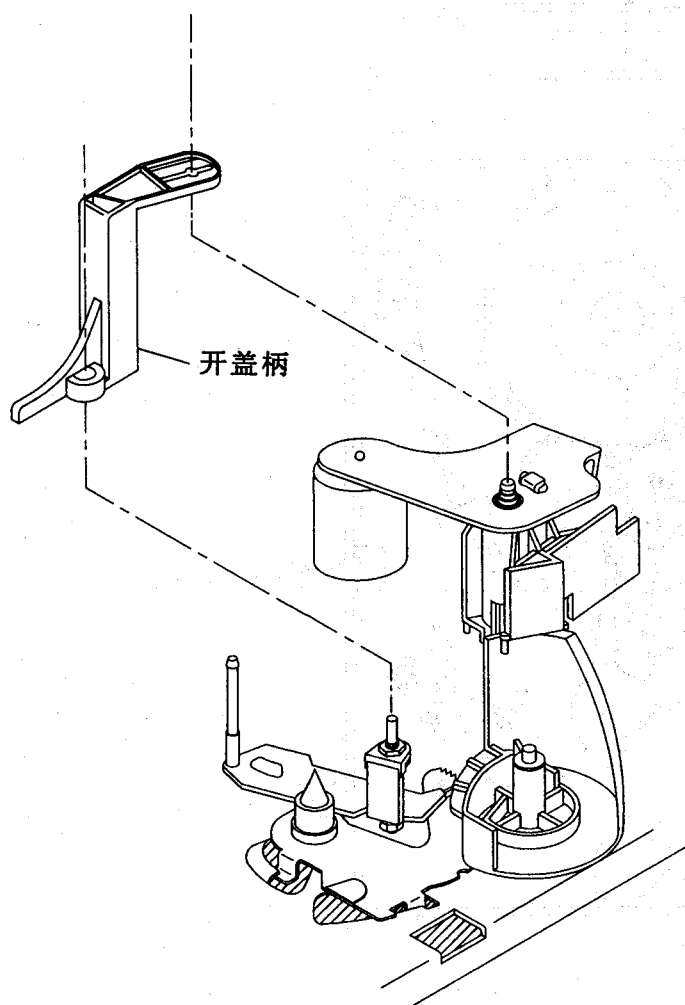
图4-45-1



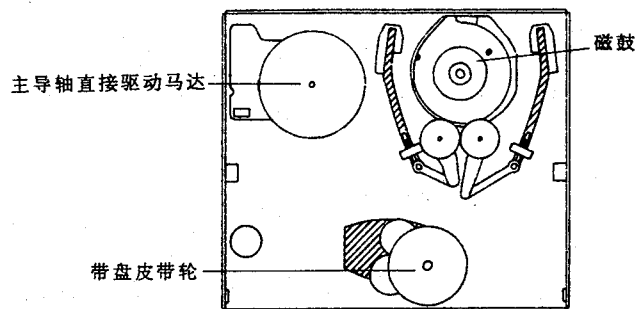
② 插入紧带轮和紧带双动杆



③ 插入开盖柄



## 2. 移行器（机芯底盘背面）的组装



(机芯底盘背面)

图4-46

1. 检查磁带装挂齿轮是否于下图所示的插入点(1)处。
2. 按要求安装移行器。这时，必须注意移行器的7个插孔和5个松解钉。
3. 为在插孔(1)处进行配相调整，请见下图的配相点(2)的放大说明。
4. 在插孔(1)和(6)处加上垫圈，紧固移行器。

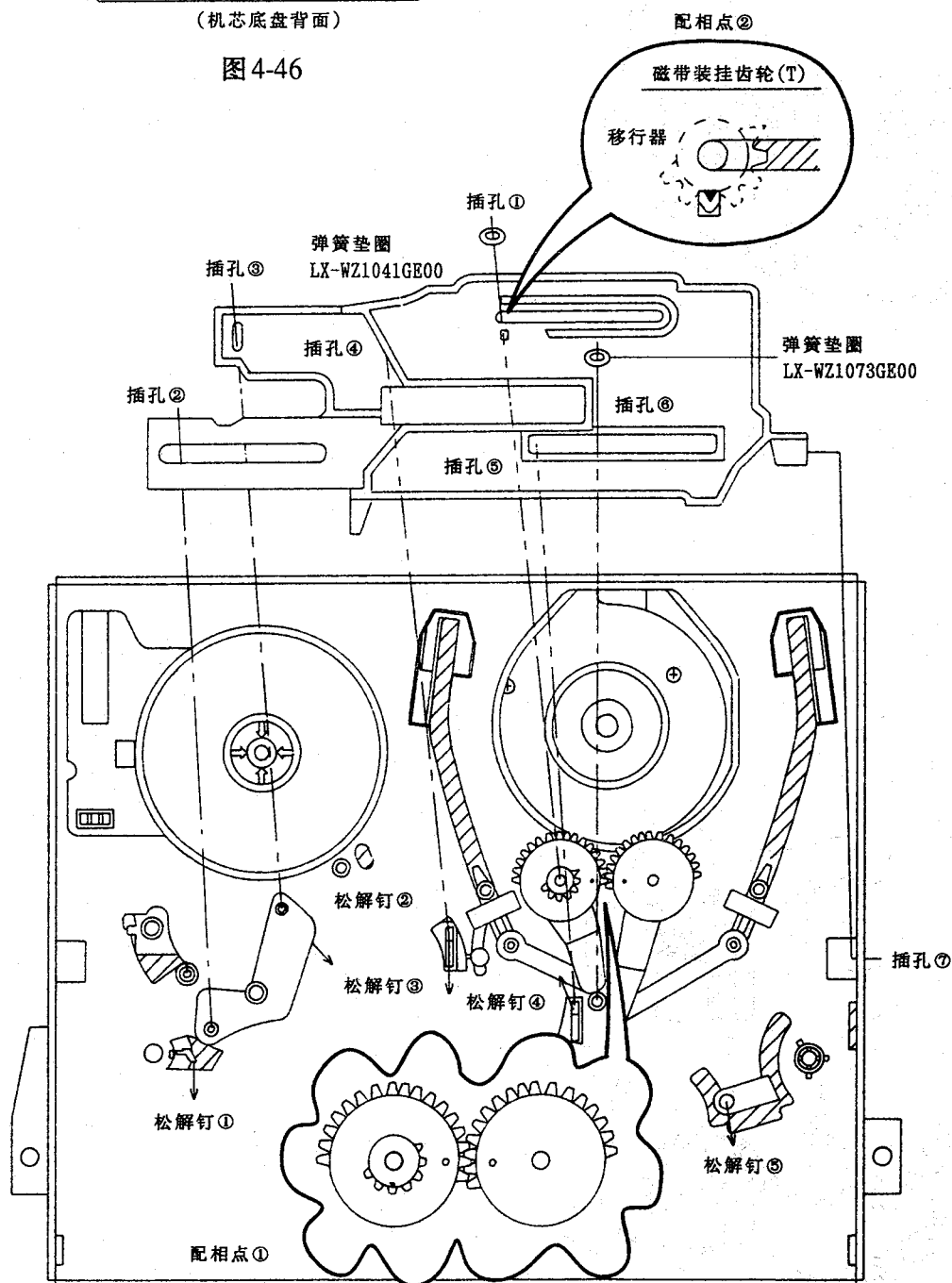


图4-47

### 3. 主凸轮（机芯底盘背面）的安装

- (1) 首先检查移行器位置是否满足下图所示要求。
- (2) 按下图所示要求安装主凸轮。

注意：

按下图所示，调整主凸轮与盒室控制机构传动齿轮间的配相点。

(3) 加弹簧垫圈，固定主凸轮。

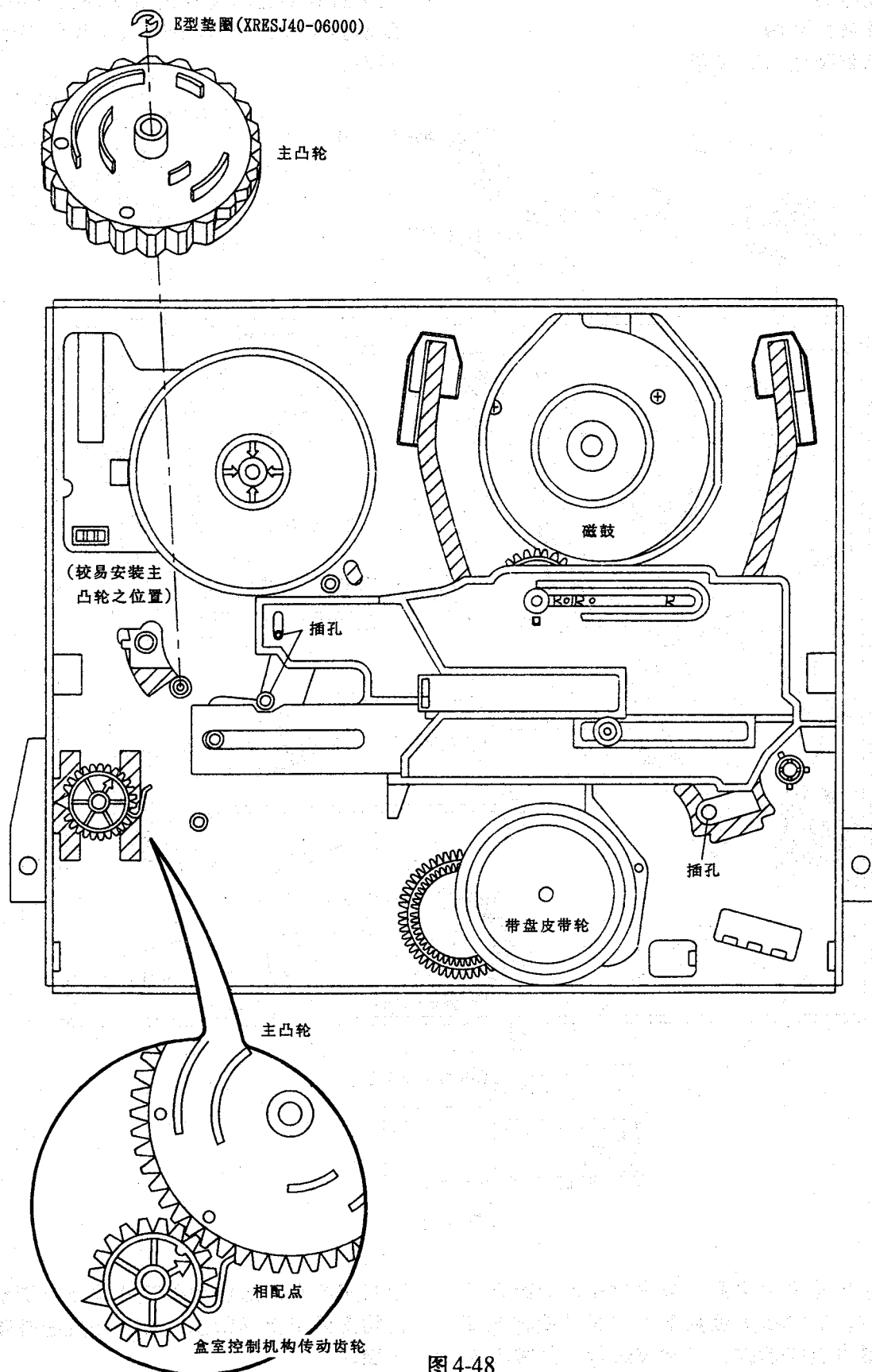


图 4-48

#### 4. 连接齿轮，慢放制动器以及磁带装挂马达（机芯底盘背面）的组装

- (1) 安装连接齿轮。
- (2) 安装慢放制动器。
- (3) 安装磁带装挂马达装置。

注意：  
让慢放制动器的脚伸出机芯底盘前面，并让其制动弹簧与音频/控制磁头左侧的卷带固定导杆相接。

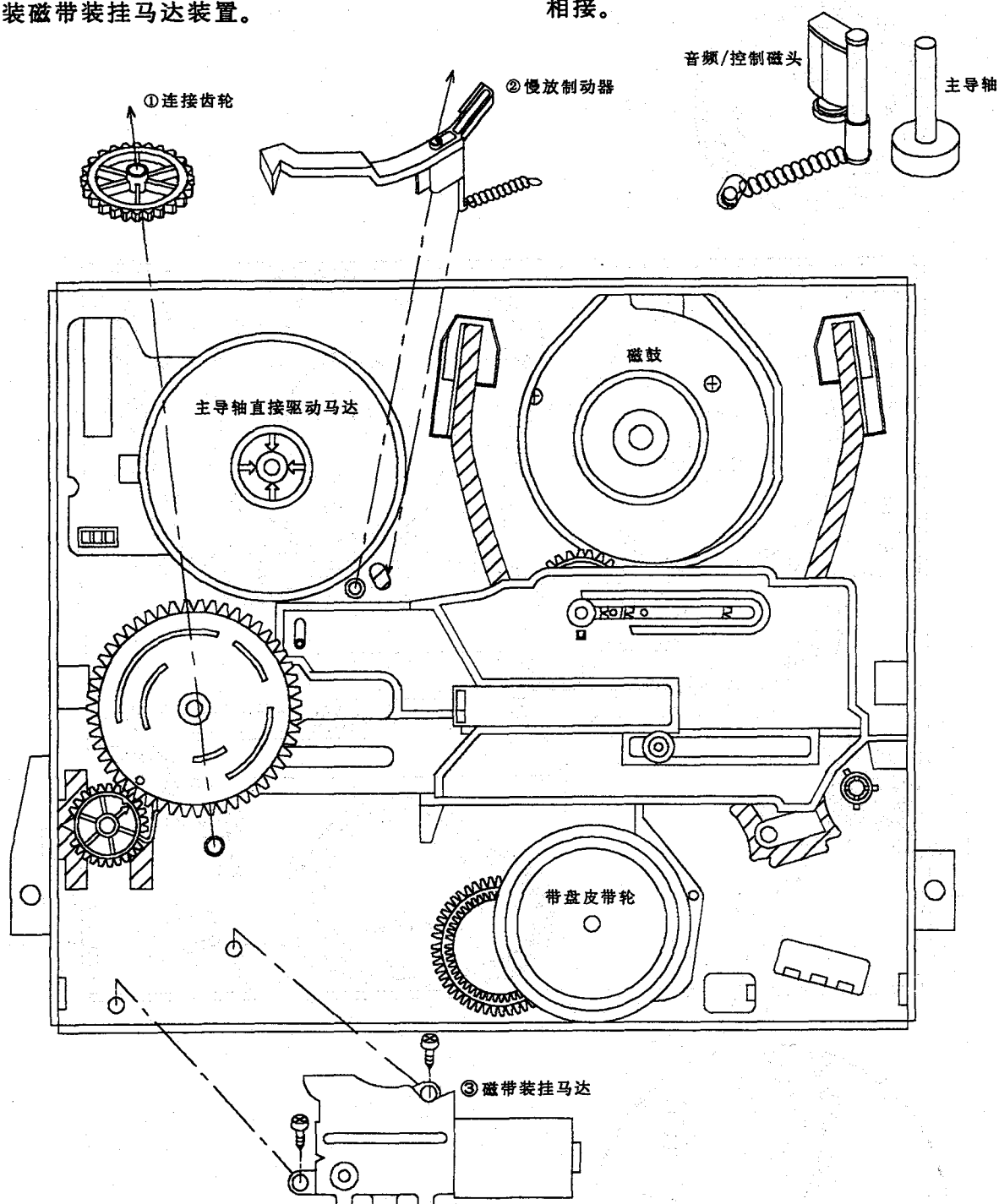


图4-49

注意：

在安装磁带装挂马达之前，应先对相位的配合进行调整检查。其检查方法如下：顺时针旋转连接齿轮检查磁带装挂动作是否相应进行，紧带辊是

否相应接带。这些动作配合均十分圆滑时，在将机构返回于上述状态。最后完成磁带装挂马达的安装。

## 磁鼓装挂马达的更换

### ● 马达的拆卸

松去两支紧固螺丝。

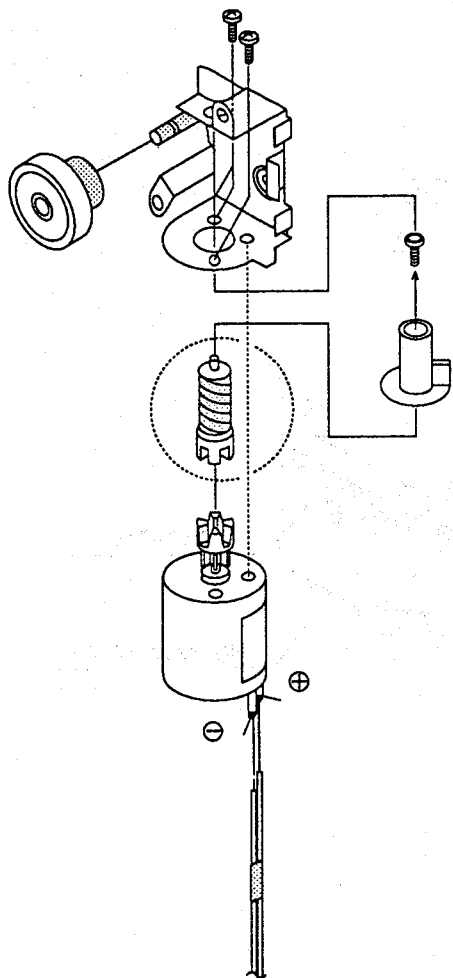


图 4-50

### ● 马达的更换

- ① 取出旧的磁带装挂马达。按上图（图4-50）所示要求装换新的磁带装挂马达。

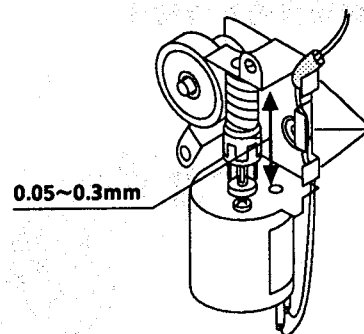
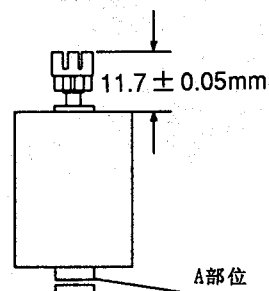


图 4-51

- ② 将蜗轮传动的推进间距调整至 $0.05 \sim 0.3\text{mm}$ 之间。用规定垫圈进行其间距的调整。



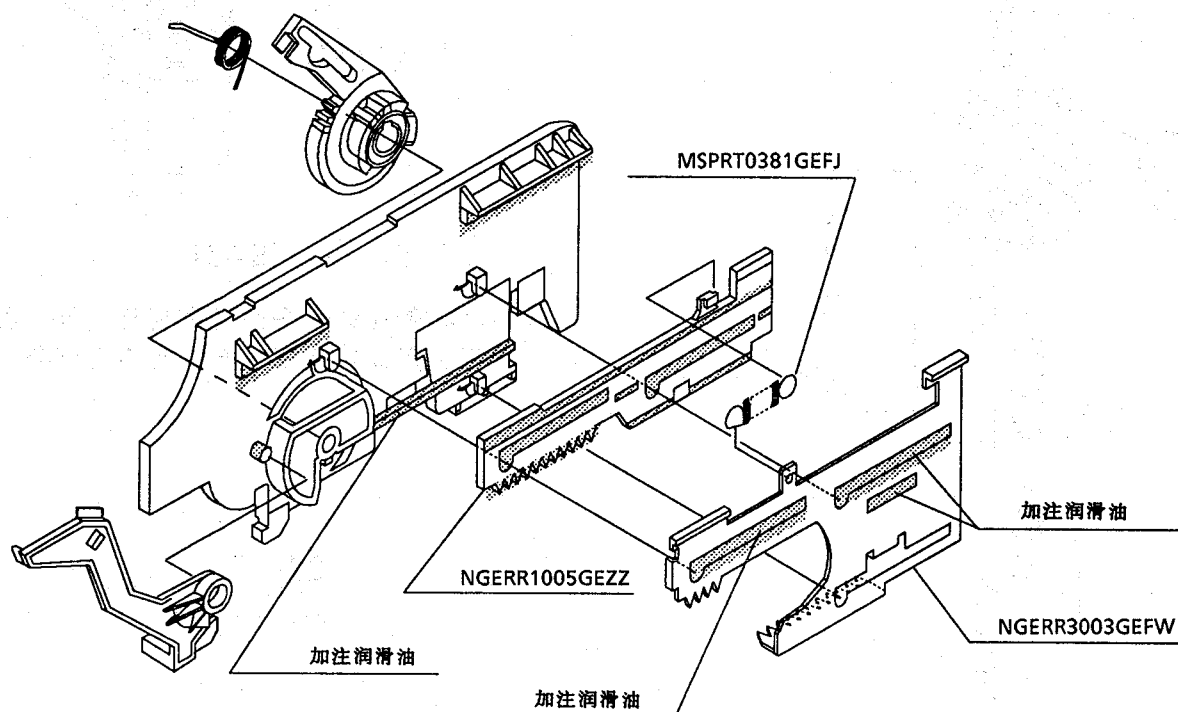
压入装挂马达，让A部位相触。

图 4-52

用小于 $98\text{N}$  ( $10\text{kgf}$ ) 的力压入磁带装挂马达皮带轮。检查皮带轮是否离马达的间距是否满足  $11.7 \pm 0.05\text{mm}$  的要求。

## 盒室控制机构的组装

### ① 右侧传动齿轮和传动杆



#### 配相点

- 固定右侧传动齿轮和传动杆于下图所示位置。

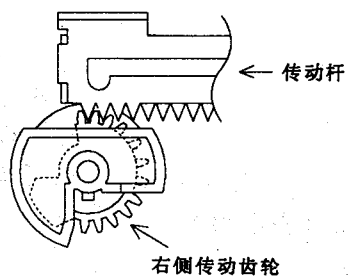


图4-53

## ② 同步齿轮、左侧传动齿轮和右侧传动齿轮

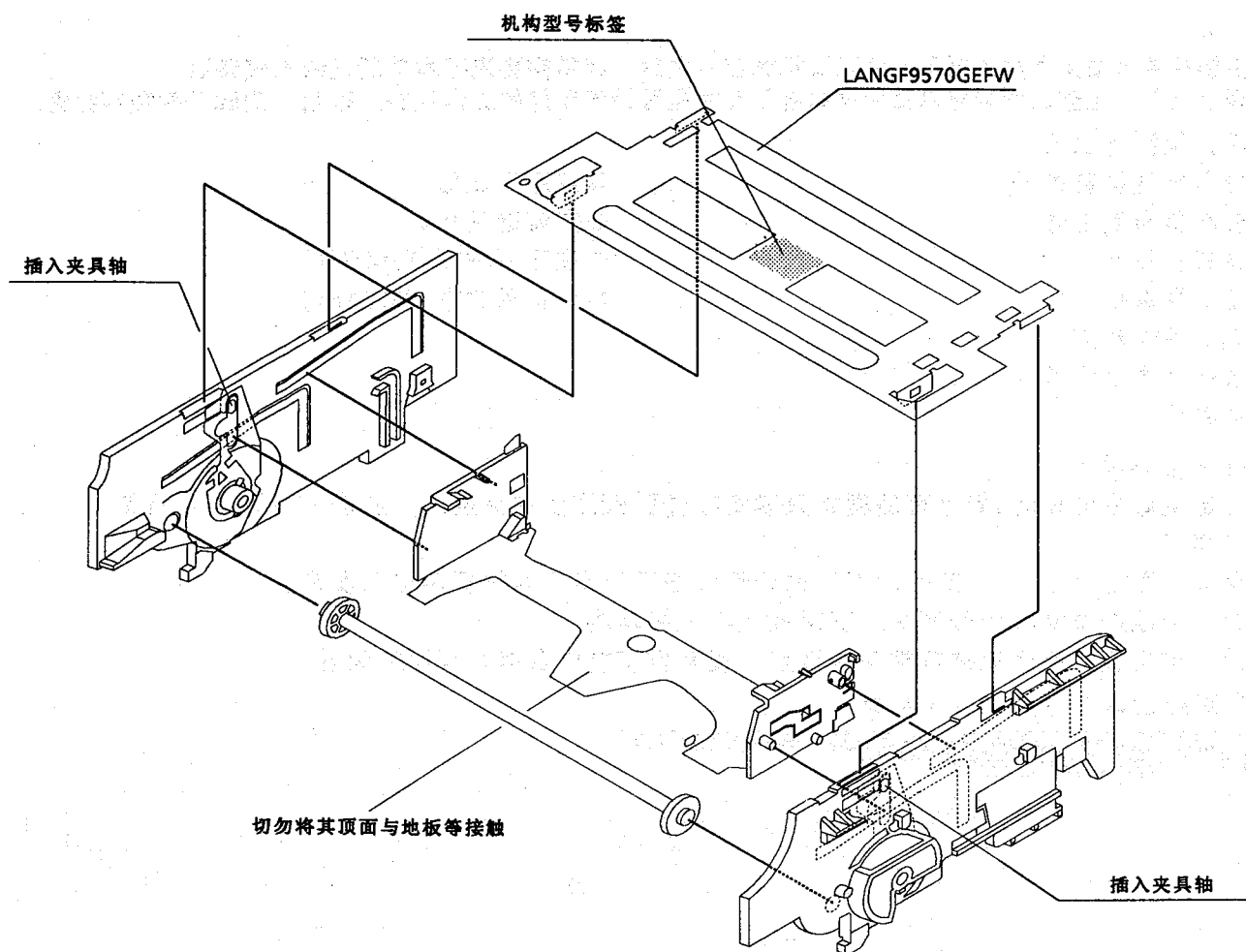


图4-54

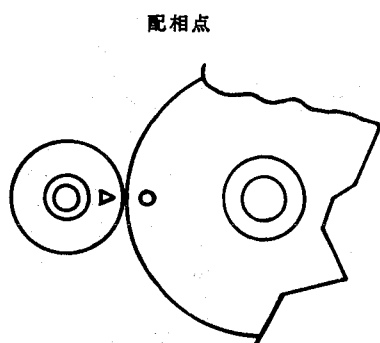


图4-55

将传动齿轮的圆孔与同步齿轮的三角标记（△）对齐。用此要领校正左、右两侧传动齿轮的位置。

### 注意：

作配相调整时，切勿颠倒左、右两侧传动齿轮的位置。这两只齿轮的一部分不带轮齿，因此可能转出同步齿轮的范围之外。这种情况发生时，需要重新进行其配相调整。

## 5 各电路的调试

注：

### ●调试前

在更换录象机磁头之类的电子元件以及机械部件之后，经常需要进行本节所述的电气调试。  
在调试之前，检查机械装置以及所有的电子元件是否处于良好的工作状态，否则，调试不能顺利完成。

### ●需要的检测用仪器

- 彩色电视机监视器
- 音频信号发生器
- 直流伏特计
- 空白录象带
- 调试用螺丝刀
- 彩条信号发生器
- 计频器

- 双踪示波器
- 交流毫伏特计
- 校正用磁带(VROCPVS)
- 校正用磁带(VROATSV)

### ☆调整注意事项：

定时器电路中的IC803静电可程式只读寄存器E<sup>2</sup>PROM发生更换时，应按下述要求重编其记忆程序。

按录象机型号而导，IC803的E<sup>2</sup>PROM的记忆程序已于出厂前按规定加以设定。

因此，应根据录象机型号要求，正确设定其记忆功能。

此外，对伺服电路还应进行磁头转换点、慢动作演放以及静止画面的调整。

### ●主电路控制调节与测试点的位置

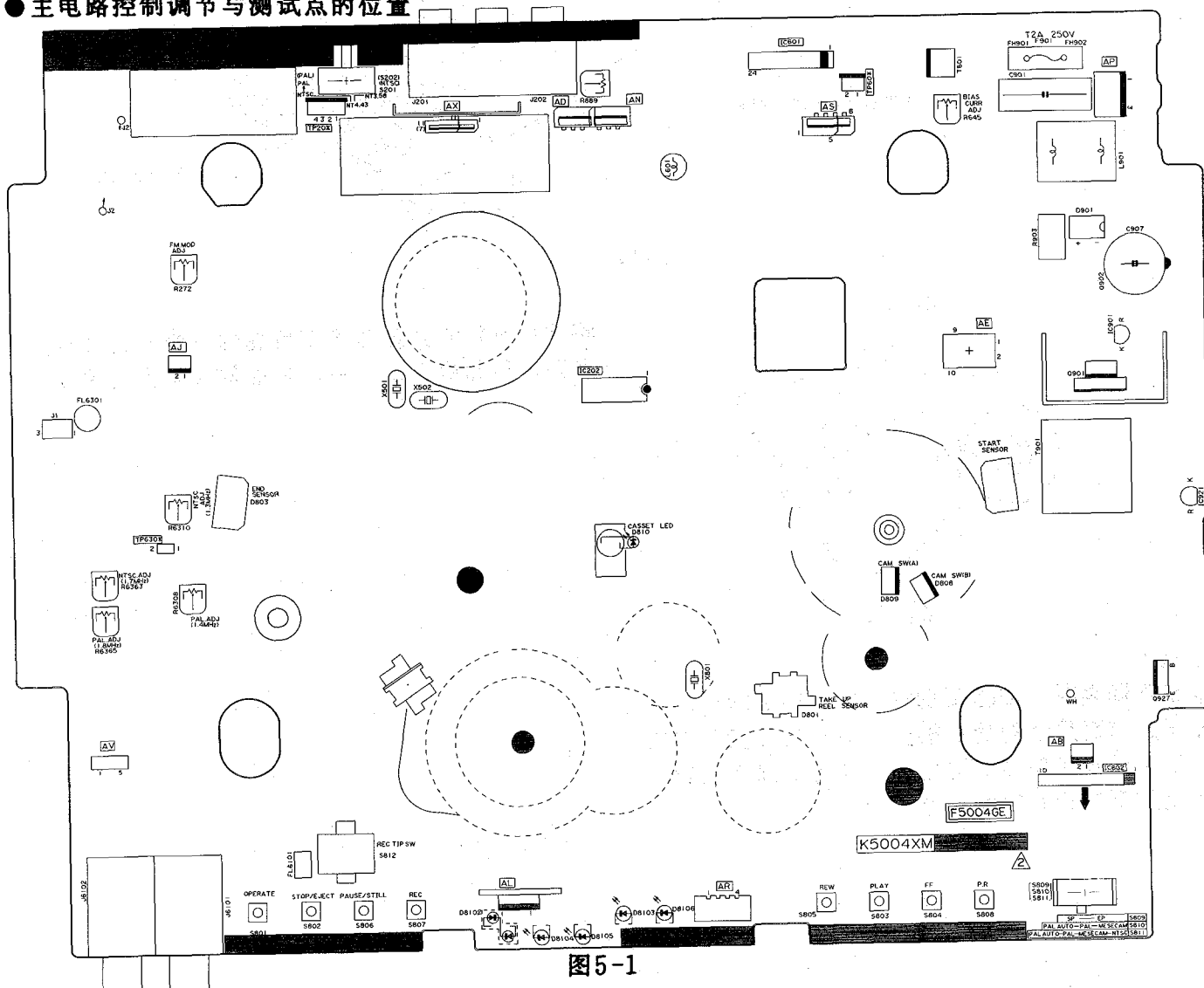


图5-1



## 伺服电路的调整

### PAL制式磁头转换点的调试

检测仪器	双轨迹示波器 监控用彩色电视机
工作状态	再现
使用磁带	校正用磁带(VROCPSV)
测试点	TP201(磁头转换点)接频道-1 视频输出插孔端接频道-2 (频道-1触发倾斜开关于 (+), 内触发于频道-1)
规定要求	$6.5 \pm 0.5H$ (线路)

1. 松开前面板。插入校正用磁带(VROCPSV), 再现之。
2. 瞬间短接主电路印刷电路板上的IC801销(3)与AT5V线路之间。  
检查于测试状态时再现用发光二极管4Hz是否闪烁。
3. 接双踪示波器于视频输出端与TP201(频道1触发倾斜开关于(+), 内触发于频道1)。
4. 观察示波器上表示的波形。所测波形幅值不符合规定要求之场合, 触按快进(FF)或快倒(REW)键以调至规定要求之范围内。
5. 触按停止(STOP)键, 让录象机返回至正常工作状态。
6. 磁头转换点调整结束后, 检查示波器荧屏上的波形是否如图5-2所示。

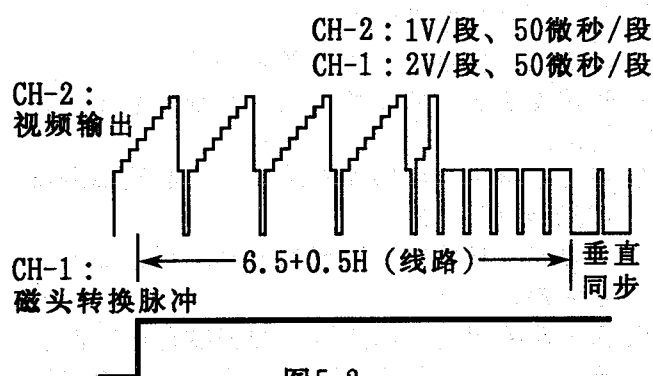


图5-2

### 录象相位的调试

检测仪器	双踪示波器 彩色电视监视器
工作状态	录象(记录)
输入信号	EIA彩条(1.0Vp-p)
使用磁带	自录磁带
测试点	TP201(磁头开关脉冲)接于 频道-1 视频输出插孔接于频道-2 (频道-1触发倾斜开关于(+), 内触发于频道-1)
调整点	R889 录象相位控制
规定要求	$7.0 \pm 0.5H$ (线路)

1. 向视频输入插孔输入PAL制式视频信号。
2. 先用遥控器设定走带速度为标准(SP)转速方式, 然后再设定于录象(记录)方式。
3. 观察示波器上的波形, 调节R889, 直至波形幅值达至上表所示的规定要求范围内为止。

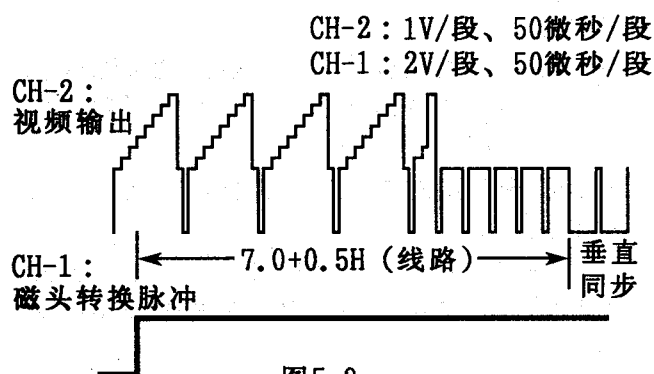


图5-3

VC-M2E/M7E  
VC-M33E/M33DR

PAL制式SP(标准)方式跟踪预设的调试

检测仪器	监控用彩色电视机
工作状态	再现 (慢速)
使用磁带	自录磁带 (SP方式) (见下注)
调整点	磁迹跟踪键 (+) 或 (-)
规定要求	监控用彩色电视机荧 屏上噪声线最小程度。

1. 向视频输入插孔输入PAL制式视频信号。
2. 用遥控器设录象机于SP (标准) 走带方式, 装入自录磁带录象之。
3. 录象后, 倒带, 再现其录象信号。
4. 触按遥控器上的慢放 (SLOW) 键, 慢动作再现之。
5. 瞬间短接主电路印刷电路板上的AT5V线路与IC801销(3)之间。  
检查于测试状态下静止用发光二极管4Hz是否闪动。
6. 观察监控用电视机荧屏, 触按磁迹跟踪键(+) 或 (-), 将荧屏上呈现的噪声线 (雪花) 调至最小程度。
7. 触按再现(PLAY)键, 让录象机返回至正常工作状态。
8. 以标准状态再现录象带数秒后, 再触按慢放 (SLOW)键, 检查电视荧屏上的噪声线是否明显。

注:

自录磁带意指于电路调整状态时录象用磁带。

NTSC制式SP (标准) 方式跟踪预设的调试。  
(型号VC-M2E/M33DR)

检测仪器	监控用彩色电视机
工作状态	再现 (慢速)
使用磁带	校正用磁带(VROATSV)
调整点	磁迹跟踪键 (+) 或 (-)
规定要求	监控用彩色电视机荧 屏上噪声线最小程度。

1. 装入校正用磁带(VROATSV), 再现之。
2. 触按遥控器上的慢速(SLOW)键, 慢动作再现之。
3. 瞬间短接主电路印刷电路板上的AT5V线路与IC801销(3)之间。  
检查于测试状态时静止用发光二极管4Hz是否闪动。
4. 观察监控用电视机荧屏, 触按磁迹跟踪键(+) 或 (-), 将荧屏上呈现的噪声线调至最小程度。
5. 触按再现(PLAY)键, 让录象机返回标准状态。
6. 再现录象带数秒后, 再触按慢速(SLOW)键, 检查电视机荧屏上的噪声线是否明显。

NTSC制式SP (标准) 方式跟踪预设的调试。  
(型号VC-M7E/M33E)

检测仪器	监控用彩色电视机
工作状态	再现 (慢速)
使用磁带	自录磁带 (SP方式) (见下注)
调整点	磁迹跟踪键 (+) 或 (-)
规定要求	监控用彩色电视机荧 屏上噪声线最小程度。

1. 向视频输入插孔输入NTSC制式视频信号。
2. 用遥控器设录象机于SP (标准) 走带方式, 装入自录磁带录象之。
3. 录象后, 倒带, 再现其录象信号。
4. 触按遥控器上的慢放 (SLOW) 键, 慢动作再现之。
5. 瞬间短接主电路印刷电路板上的AT5V线路与IC801销(3)之间。  
检查于测试状态下再现用发光二极管4Hz是否闪动。
6. 观察监控用电视机荧屏, 触按磁迹跟踪键(+) 或 (-), 将荧屏上呈现的噪声线 (雪花) 调至最小程度。
7. 触按再现(PLAY)键, 让录象机返回至正常工作状态。
8. 以标准状态再现录象带数秒后, 再触按慢放 (SLOW)键, 检查电视荧屏上的噪声线是否明显。

注:

自录磁带意指于电路调整状态时录象用磁带。

PAL制式静止画面FV（虚假垂直同步）的调试。

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面
使用磁带	自录磁带(SP方式) (见下注)
调整点	磁迹跟踪键(+)或(-)
规定要求	电视荧屏上无垂直晃抖

1. 装入自录磁带，用SP方式录象后，再现之。
2. 触按暂停/静止(PAUSE/STILL)键，静止再现图象。
3. 观察监控用电视机荧屏，触按磁迹跟踪键(+)或(-)，将荧屏上呈现的噪声线(雪花)调至最小程度。
4. 用SP方式再现自录磁带，静止再现图象，检查电视荧屏上的噪声线是否明显。

注：

自录磁带意指于电路调整状态时录象用磁带。

NTSC制式静止画面FV（虚假垂直同步）的调试  
(型号VC-M2E/M33DR)

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面
使用磁带	校正用磁带(VROATSV)
调整点	磁迹跟踪键(+)或(-)
规定要求	电视荧屏上无垂直晃抖

1. 装入校正用磁带(VROATSV)，再现之。
2. 触按暂停/静止(PAUSE/STILL)键，静止再现图象。
3. 观察监控用电视机荧屏，触按磁迹跟踪键(+)或(-)，将荧屏上呈现的噪声线(雪花)调至最小程度。
4. 用SP方式再现自录磁带，静止再现图象，检查电视荧屏上的噪声线是否明显。

NTSC制式静止画面FV（虚假垂直同步）的调试  
(型号VC-M7E/M33E)

检测仪器	监控用彩色电视机
工作状态	再现状态静止画面
使用磁带	自录磁带(SP方式) (见下注)
调整点	磁迹跟踪键(+)或(-)
规定要求	电视荧屏上无垂直晃抖

1. 装入自录磁带，用SP方式录象后，再现之。
2. 触按暂停/静止(PAUSE/STILL)键，静止再现图象。
3. 观察监控用电视机荧屏，触按磁迹跟踪键(+)或(-)，将荧屏上呈现的噪声线(雪花)调至最小程度。
4. 用SP方式再现自录磁带，静止再现图象，检查电视荧屏上的噪声线是否明显。

注：

自录磁带意指于电路调整状态时录象用磁带。

## 亮度/色度信号电路的调整

### 视频E-E增益的调整

检测仪器	示波器
工作状态	E-E或录象
输入信号	EIA彩条 (1.0Vp-p)
测试点	视频输出端
规定要求	1.0V $\pm$ 0.1 Vp-p)

1. 接75 $\Omega$ 端电阻于视频输出端，再接示波器两探针于该端电阻两端。(见下注)
2. 向视频输入端输入彩条信号。
3. 让E-E信号振幅达至如图5-4所示的1.0Vp-p的规定要求。

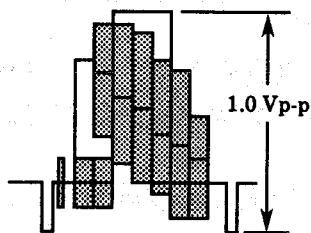


图5-4

注：如不接75 $\Omega$ 端电阻，输出波形幅值应为上述值之两倍。

### 白色限幅的调整

检测仪器	示波器
工作状态	E-E或录象
输入信号	EIA彩条 (1.0Vp-p)
测试点	IC201的销(48)、GND
规定要求	190 $\pm$ 5% (见下注)

1. 接示波器于IC201销(48)和接地GND。
2. 设录象机于E-E状态。向视频输入端输入彩条信号。
3. 检查视频信号过调量的限幅是否符合如图5-5所示的190%的规定要求。

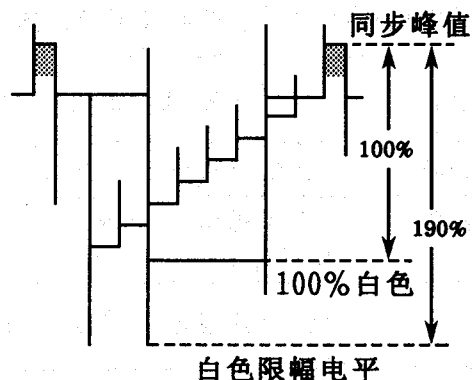


图5-5

注：

从同步峰值至白色峰值，其电平为100%。于白色电平之上，白色限幅电平为90%。

### 调频(FM)MOD的调试 (型号VC-M7E/M33E)

检测仪器	计频器 示波器
工作状态	录象/再现
输入信号	EIA(NTSC4.43)彩条 (1.0Vp-p)
测试点	TP202, TP204(接地) 视频输出插孔
调整点	R272FM MOD控制
规定要求	3.4 $\pm$ 0.05MHz 1.0 $\pm$ 0.04Vp-p

1. 设NTSC制式开关(录象机背面的滑钮)于NT4.43或NT $\rightarrow$ PAL CTV位置。
2. 接75 $\Omega$ 端电阻于视频输出端，再接示波器两探针于该端电阻两端。  
(见下注说明)
3. 接计频器于测试点TP202(信号)和TP204(接地)之间。
4. 设录象机于声象输入状态。切勿向视频输入端输入视频信号。(拆去视频输入端的所有接线。)
5. 调节R272，使计频器所测的读数达至3.4MHz的规定要求。
6. 装入记录EIA彩条信号(NTSC4.43)的录象带，再现之。
7. 检查再现彩条信号幅值是否为图5-6所示1.0  $\pm$  0.04Vp-p的规定要求。

注：

如不接75 $\Omega$ 端电阻，输出波形幅值应为上述之两倍。

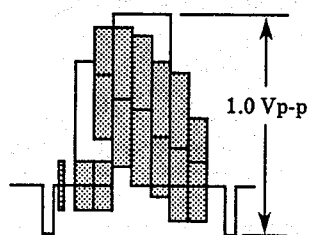


图 5-6

## 再现增益的调整

检测仪器	示波器
工作状态	记录/再现
输入信号	EIA彩条 (1.0Vp-p)
测试点	视频输出端
规定要求	$1.0V \pm 0.1 V_{p-p}$

1. 先确认E-E电平的调试已符合规定要求。
2. 于视频输出插孔端接一只 $75\Omega$ 终端电阻。  
示波器跨接此终端电阻。  
(见下注)
3. 向视频输入插孔端输入彩条信号。设录象机于记录状态。
4. 再现记录有输入彩条信号部分的磁带内容。
5. 检查这时的输出信号幅值是否符合图5-7所示的 $1.0V_{p-p}$ 的规定要求。

注：

如不接 $75\Omega$ 端电阻，输出波形幅值应为上述之两倍。

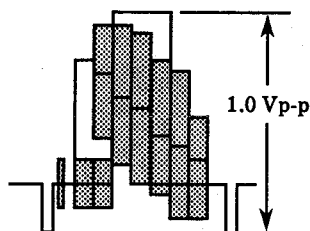


图 5-7

## 音频电路的调试

### 线性音频E-E电平的调试

检测仪器	交流毫伏特计
工作状态	E-E或记录（录象）
输入信号	1kHz, -8dBs
测试点	音频输出插孔
规定要求	$-8 \pm 2\text{dBs}$

1. 向音频输入插孔输入上表所示的音频信号。
2. 接交流毫伏特计于音频输出插孔。
3. 设录象机于E-E或记录（录象）状态。检查交流毫伏特计所测的读数是否符合上表所述的规定要求。

### 线性音频偏流的调试

检测仪器	示波器
工作状态	记录（录象）
输入信号	无规定要求
测试点	TP601(信号)~TP602(接地)
调整点	R645偏流控制
规定要求	$2.5 \pm 0.1\text{mVrms}$

1. 接示波器于测试点TP601(信号)和TP602(接地)之间。  
(将TP602作为接地线使用之)
2. 设录象机于记录状态, 调节R645, 使信号波形幅值达至 $2.5\text{mVrms}$ 的规定要求。

### 线性音频再现电平的调试

检测仪器	交流毫伏特计
工作状态	再现
输入信号	校正用磁带(VROCPZJS)
测试点	音频输出插孔
规定要求	$-9.0 \pm 2\text{dBs}$

1. 接交流毫伏特计于音频输出插孔。
2. 装入校正用磁带(VROCPZJS), 再现之。
3. 检查交流毫伏特计所测的音频输出电平值是否符合规定要求。  
所测值不符合规定要求之场合, 则检查偏流。  
(线性音频偏流的调试)。

### 标准音频自录/再现电平的调试

检测仪器	交流毫伏特计
工作状态	记录（录象）/再现
输入信号	1kHz, -8.0dBs
测试点	音频输出插孔
规定要求	$-8.0\text{dBs} \pm 3\text{dBs}$

1. 向音频输入插孔输入上表所示的音频信号。
2. 接交流毫伏特计于音频输出插孔。
3. 检查交流毫伏特计所测的读数是否符合规定要求。

### 消磁电压和振荡频率的调试

检测仪器	示波器
工作状态	记录（录象）
测试点	完全消磁磁头
调整点	T6301
规定要求	$70 \pm 5\text{kHz}$ , 大于 $40\text{Vp-p}$

1. 设录象机于记录（录象）状态。
2. 接示波器于完全消磁磁头之两端。
3. 检查其磁头两端的消磁电压是否近似于或大于 $40\text{Vp-p}$ , 以及频率为 $70 \pm 5\text{kHz}$ 。

## 卡拉OK电路的调试 (型号 VC-M33E/M33DR)

### 麦克风1和麦克风2电平的检查

检测仪器	交流毫伏特计
工作状态	E-E
输入信号	1kHz, -62.0dBs (音频信号)
测试点	音频输出插孔
规定要求	$-15.0 \pm 3\text{dBs}$

1. 接交流毫伏特计于音频输出插孔。
2. 交替设麦克风控制与回声控制于最大和最小位置。
3. 向麦克风1输入插孔输入1kHz, -62.0dBs的音频信号。
4. 设录象机于E-E状态。
5. 检查交流毫伏特计所测的读数是否符合规定要求。
6. 按上记步骤进行麦克风2输入插孔的检查。
7. 旋转麦克风控制旋钮, 检查音频信号电平是否逐渐地进行变化。检查结束后, 必须将该旋钮旋回至中央位置。

### 回声系统的检查

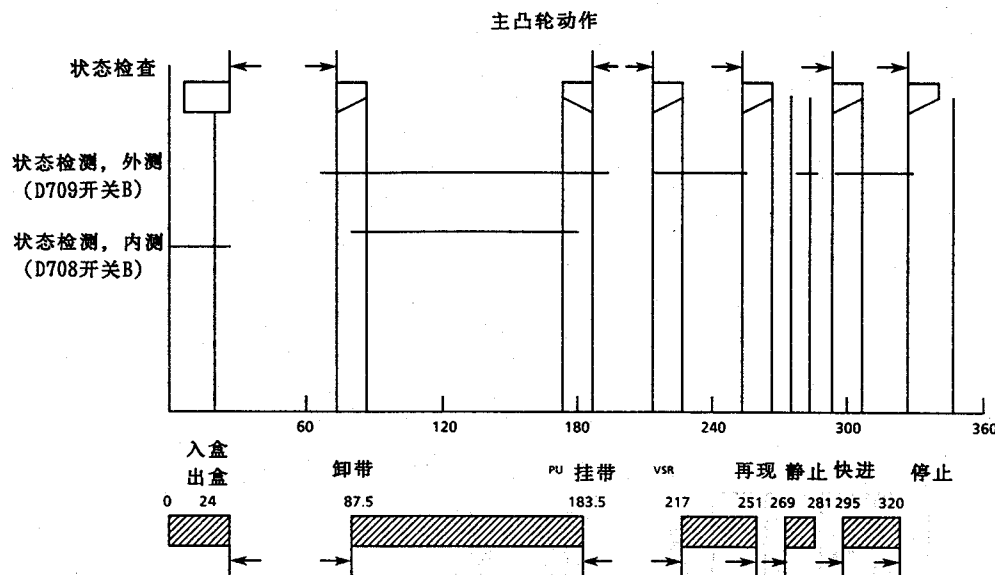
工作状态	E-E
输入信号	1kHz, -62.0dBs (音频信号)
测试点	音频输出插孔
规定要求	—————

1. 向麦克风1输入插孔输入1kHz, -62.0dBs的音频信号。
2. 设录象机于E-E状态。
3. 旋回声控制旋钮于最小位置, 以确认无回声信号输出。
4. 旋回声控制旋钮于最大或中央位置, 以确认回声信号输出。

# 6. 机械动作流程图及机械故障检修

机械动作流程图

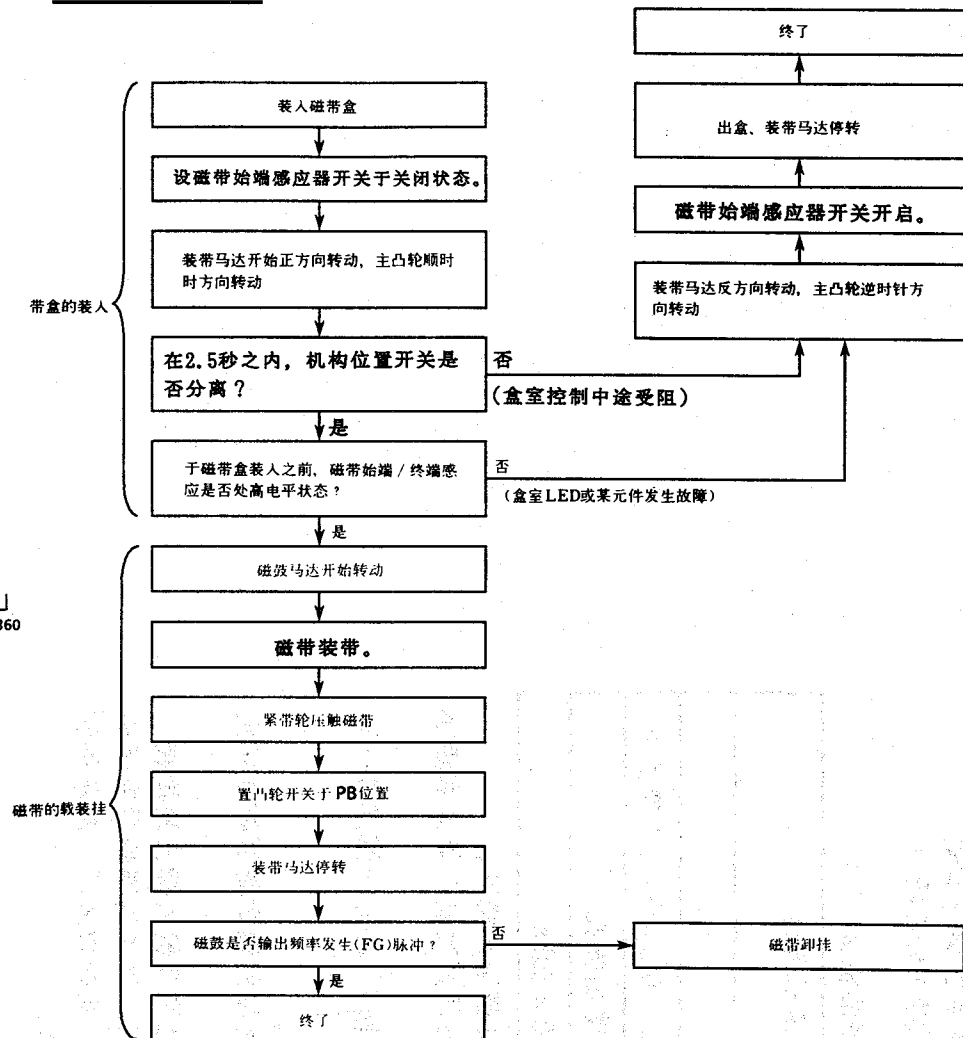
\*该流程图说明本录像机机械动作的大致概要，而不对其作详细具体的说明。



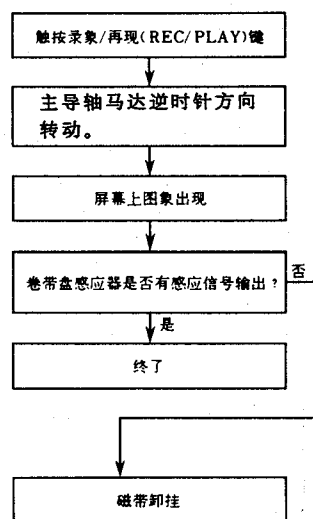
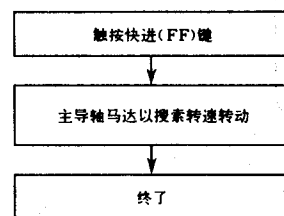
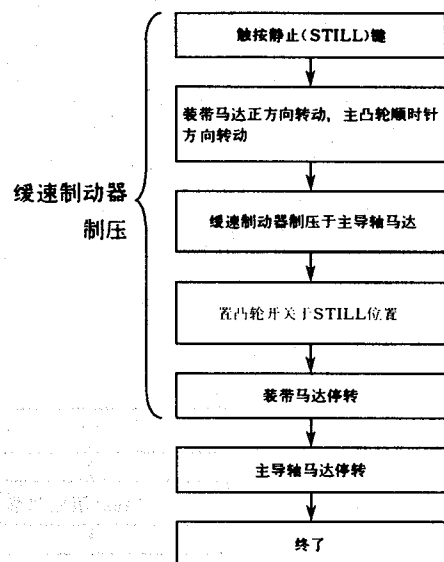
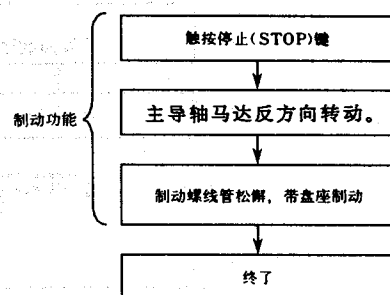
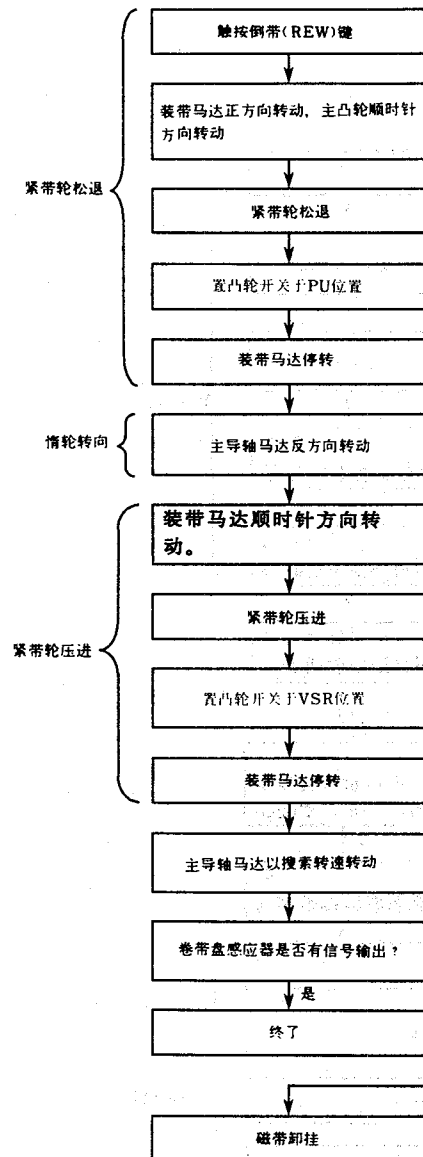
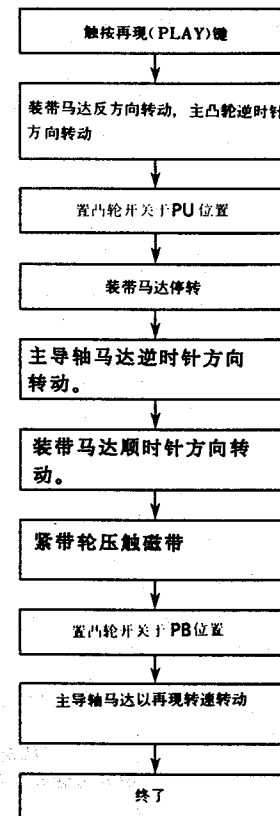
	CS/EJ						ULD		PU LD		VSR		PB	STL	FF	STOP
状态检测、外侧	0	0	0	0	0	1	1		1	1	0	1	0	1	0	0
状态检测、内侧	1	1	0	0	0	0	1		1	0	0	0	0	0	0	0
磁带始端感应器	1	1	0	1	1	0	0									

磁带始端感应器 断开 闭合

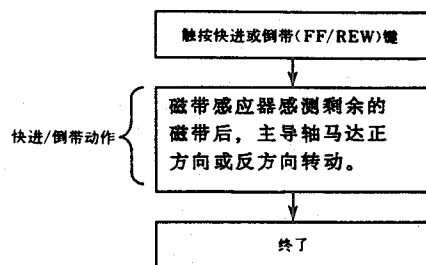
装入录像磁带→动作停止



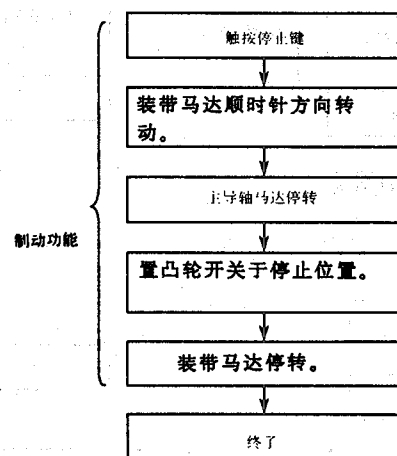


停止状态→录像/再现再现→视频搜索快进再现状态→静止快进/倒带→停止状态再现→视频搜索倒带视频搜索倒带→再现

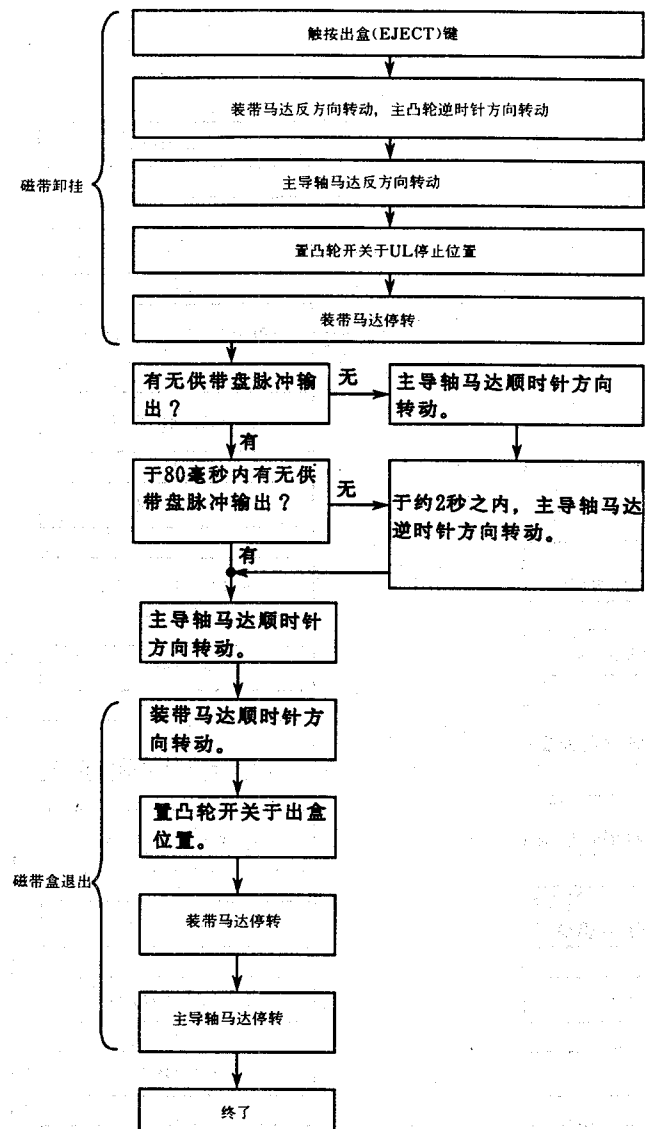
停止状态→快进/倒带



录像/再现→停止状态



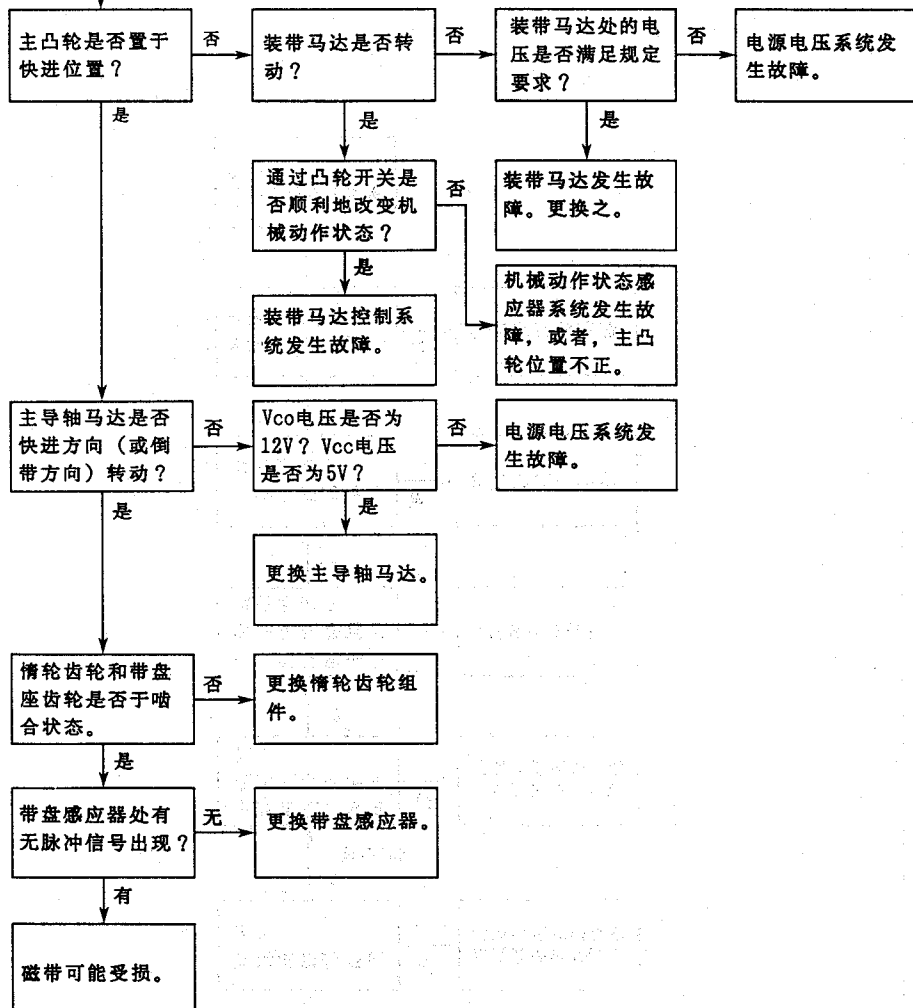
停止状态→出盒



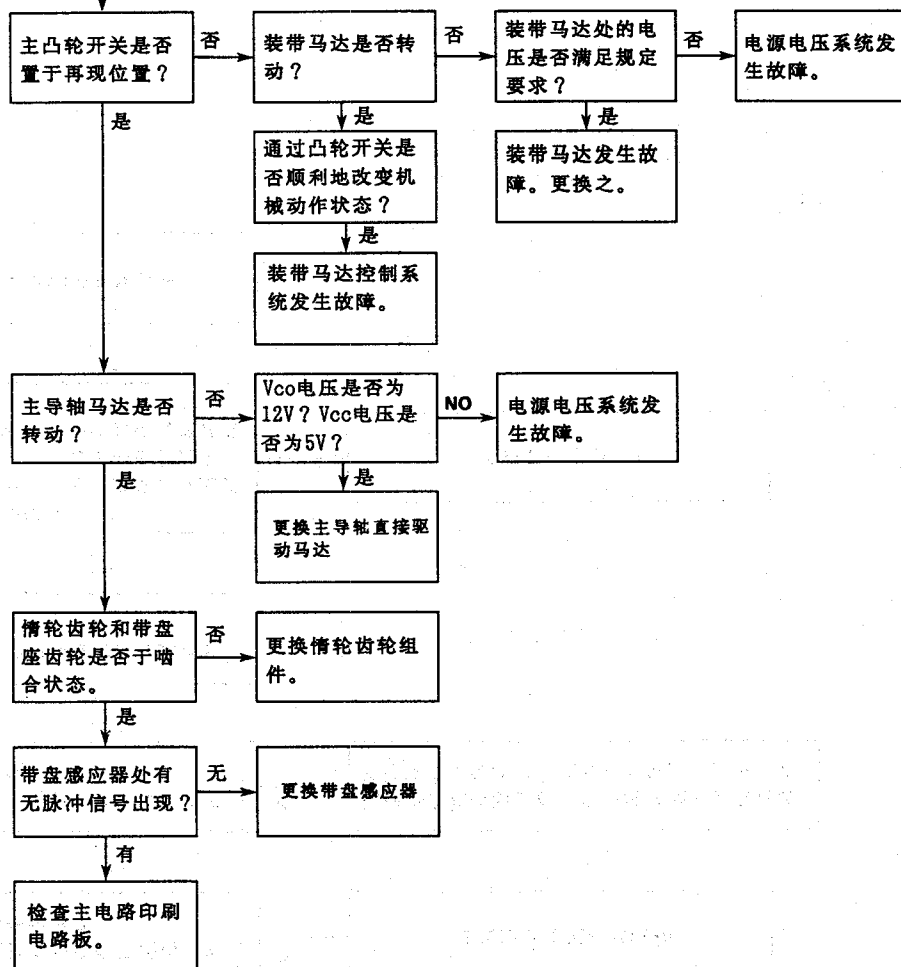
## 机械故障检查

## 1. 快进 / 倒带不动作 (不卷带)

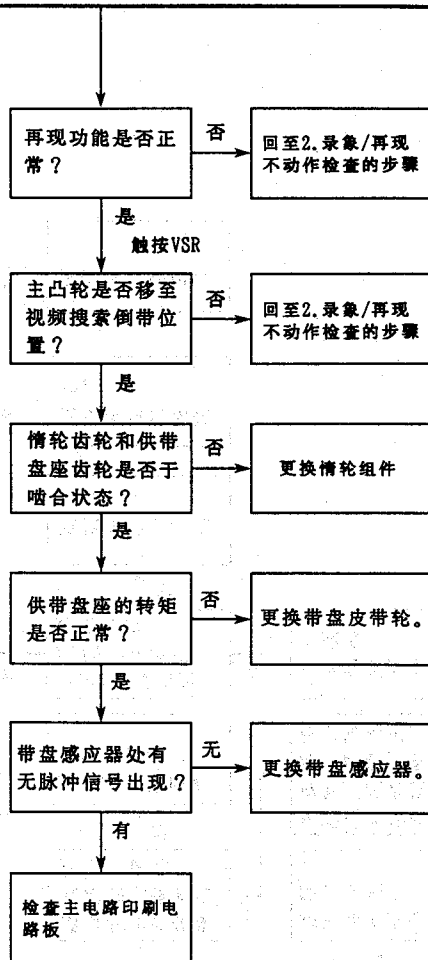
触按快进键



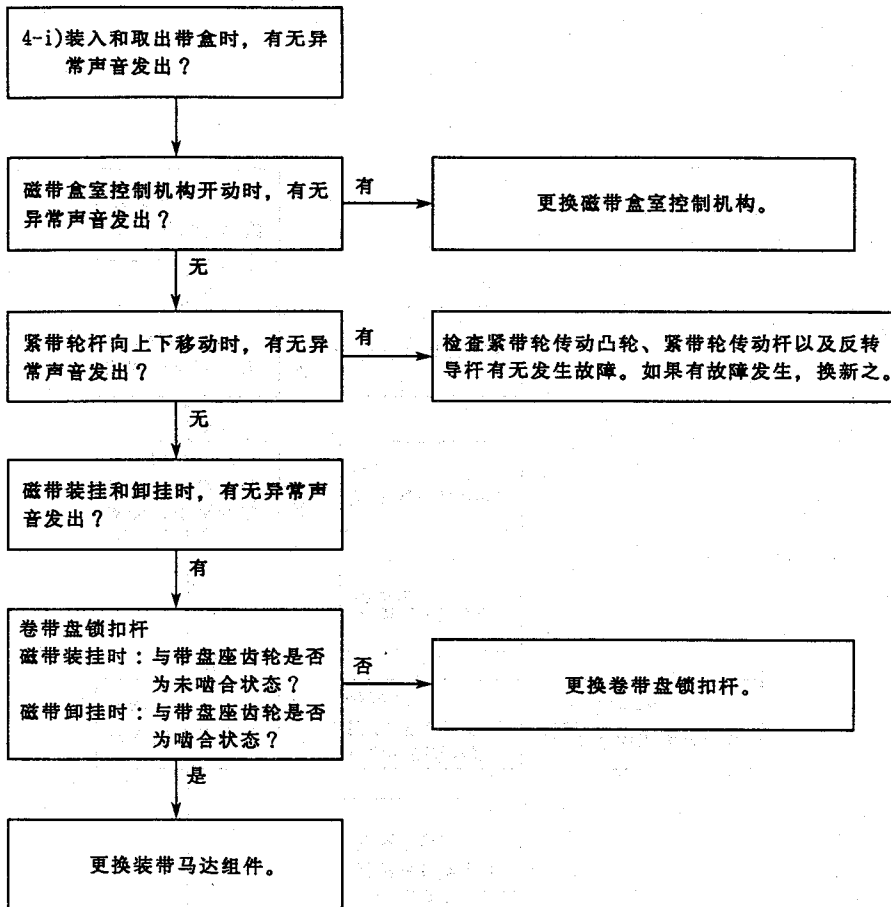
## 2. 录像 / 再现不动作 (状态解除)

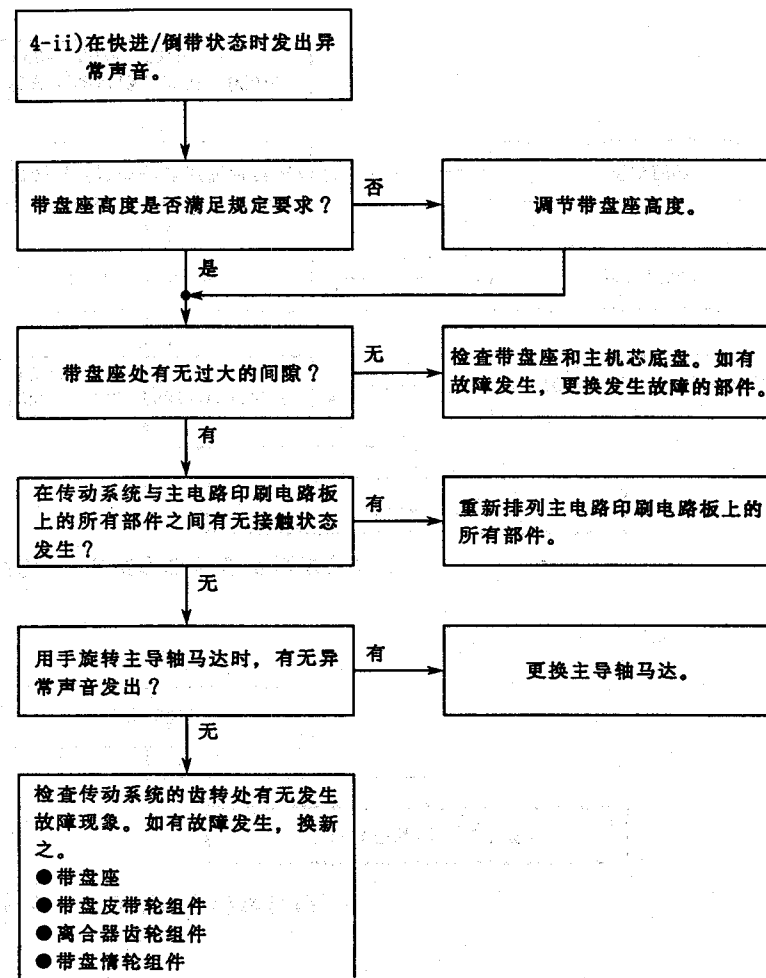


### 3. 视频搜索倒带不动作 (不卷带)



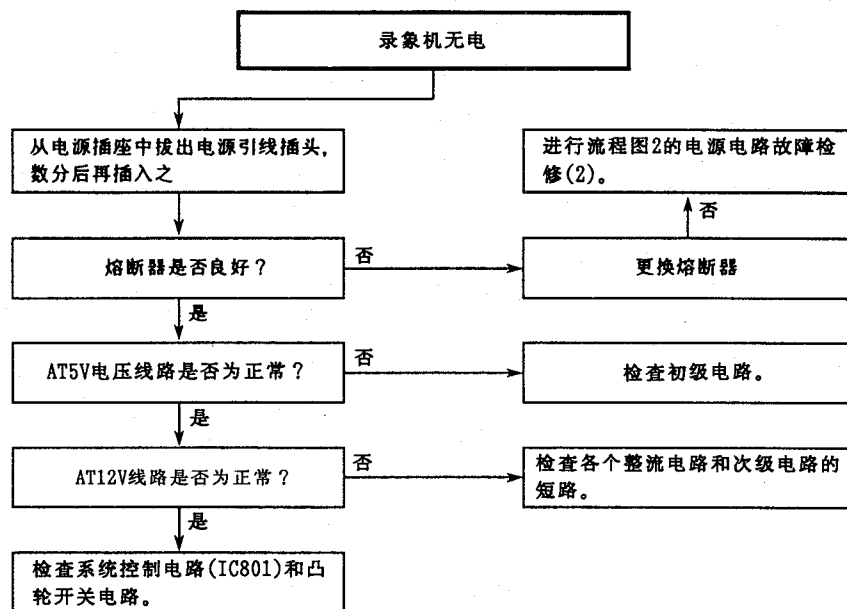
### 4. 于各工作状态均发出异常声音



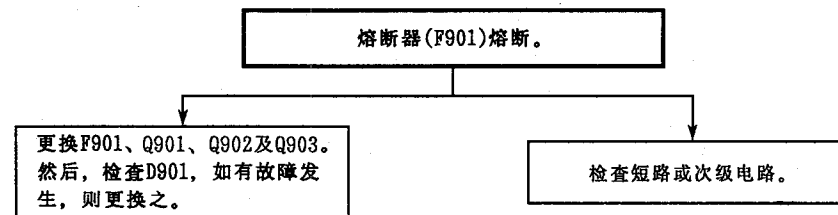


## 7 故障检修表

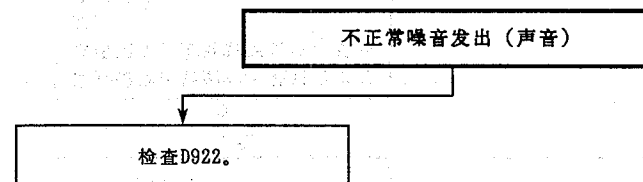
流程图1 电源电路的故障检查(1)



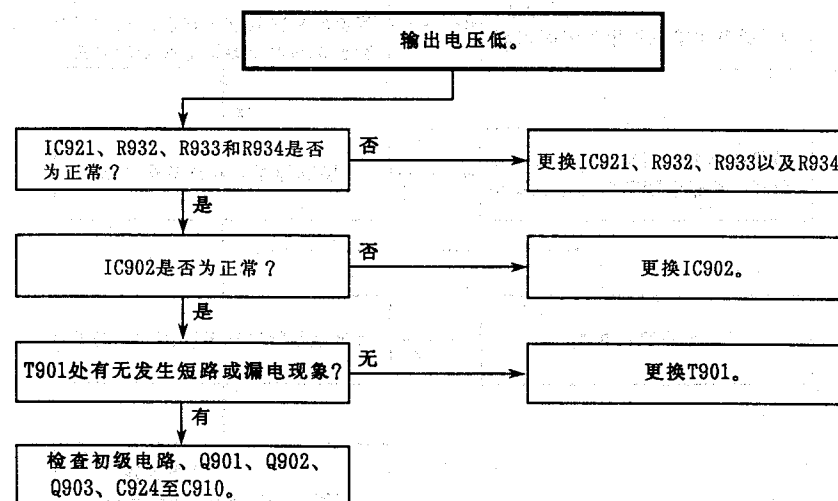
流程图2 电源电路的故障检修(2)



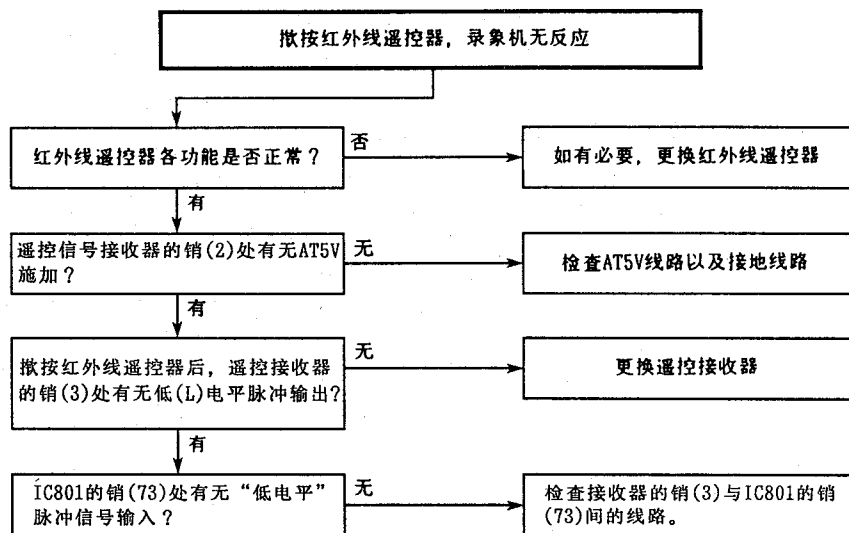
流程图3 电源电路的故障检修(3)



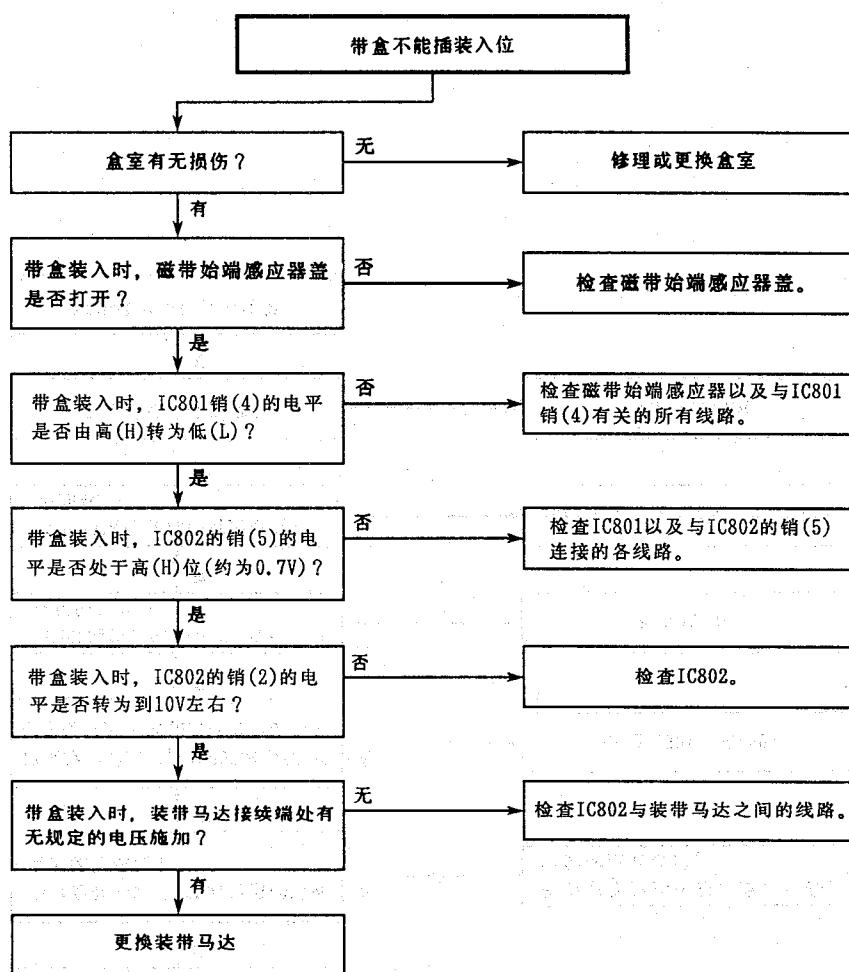
流程图4 电源电路的故障检修(4)



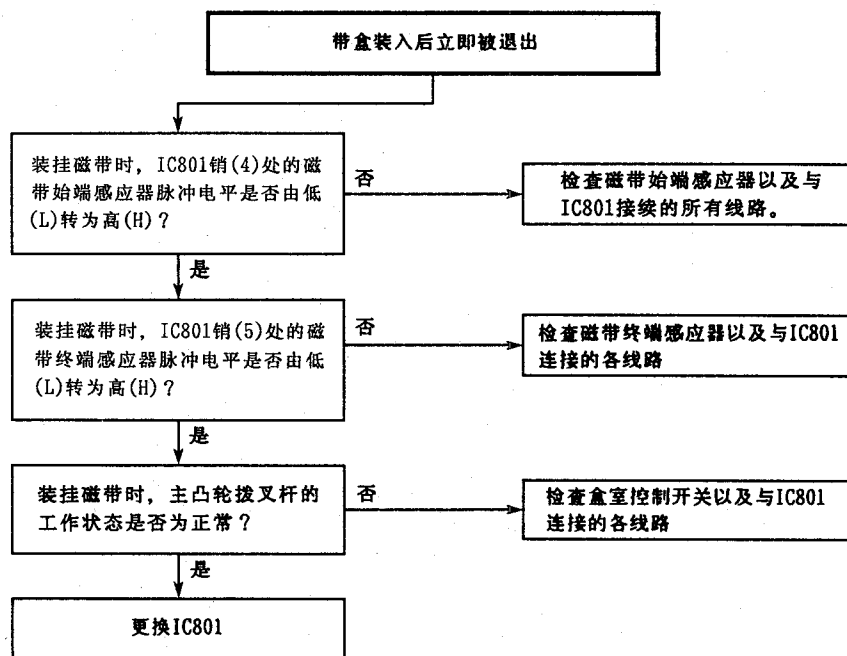
流程图5 红外线遥控器的故障检查



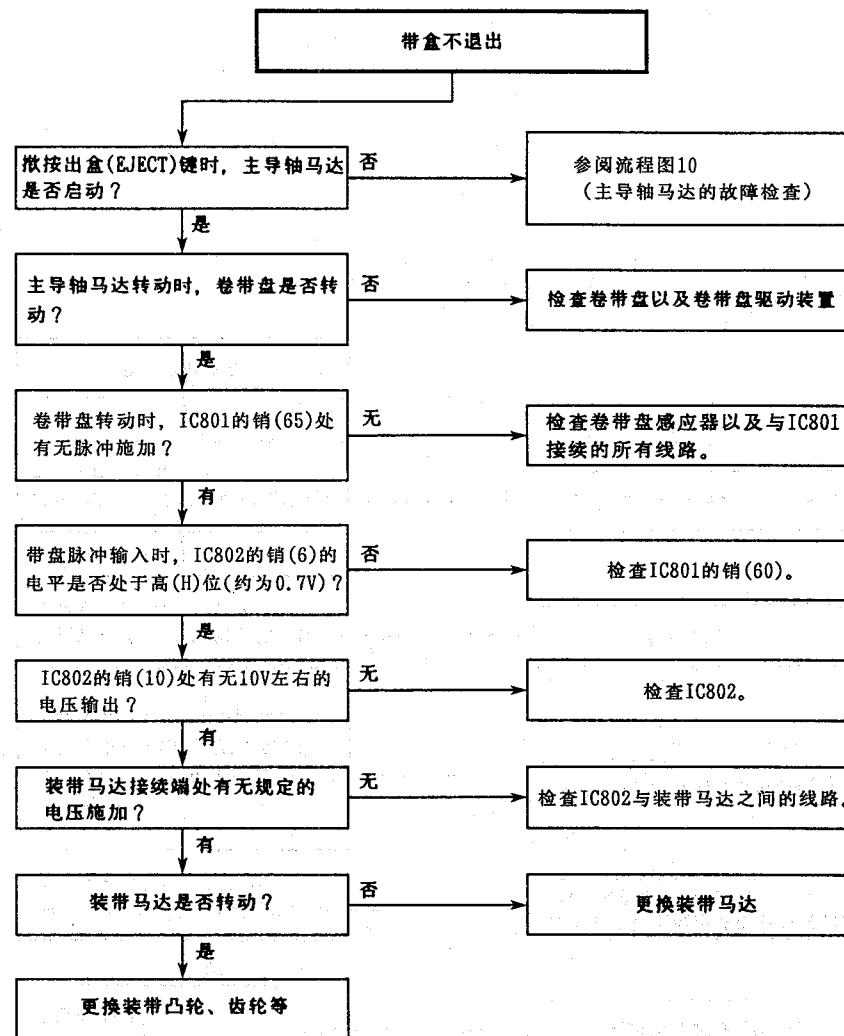
流程图6 磁带盒室控制机构的故障检查(1)



流程图7 磁带盒室控制机构的故障检查(2)

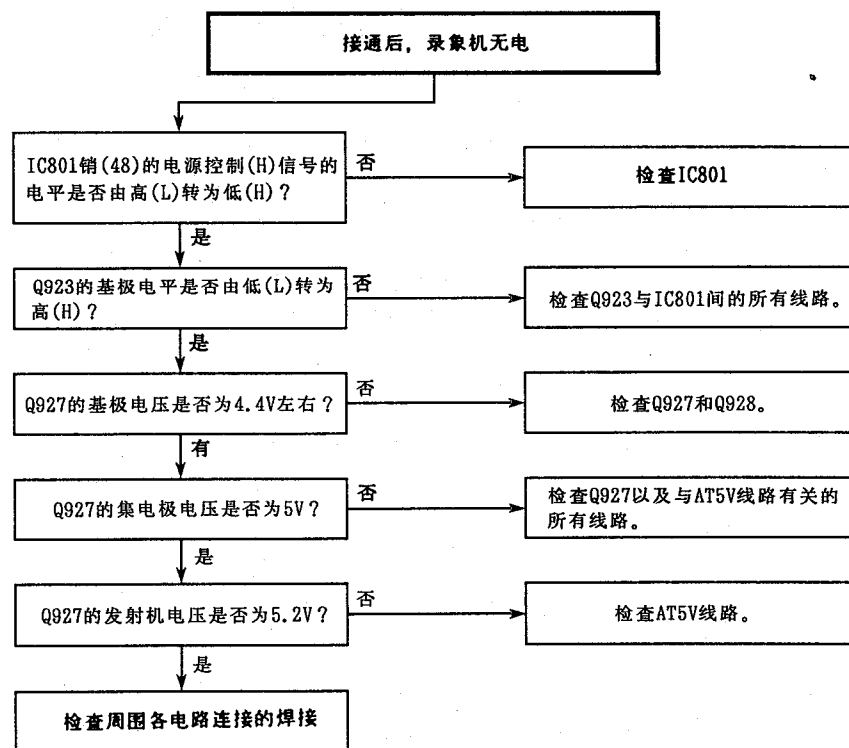


流程图8 装带马达以及出盒动作的故障检查

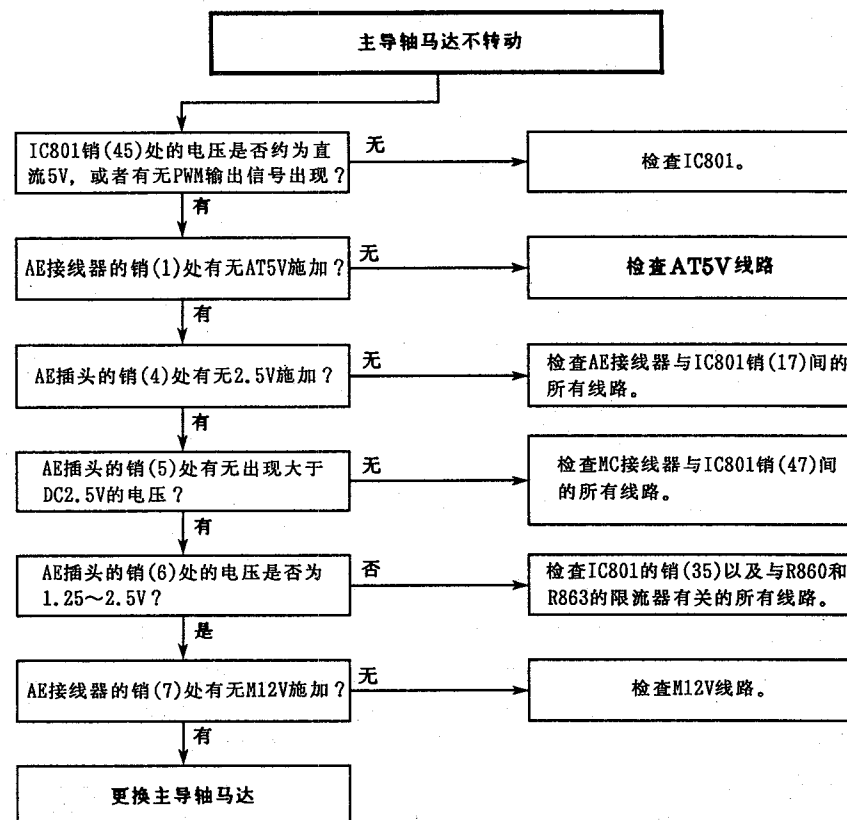




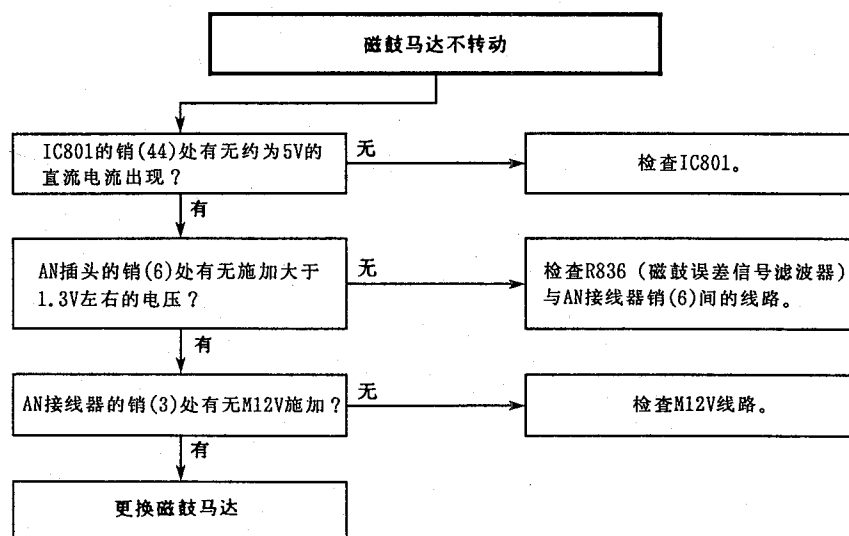
流程图9 系统控制电路的故障检查



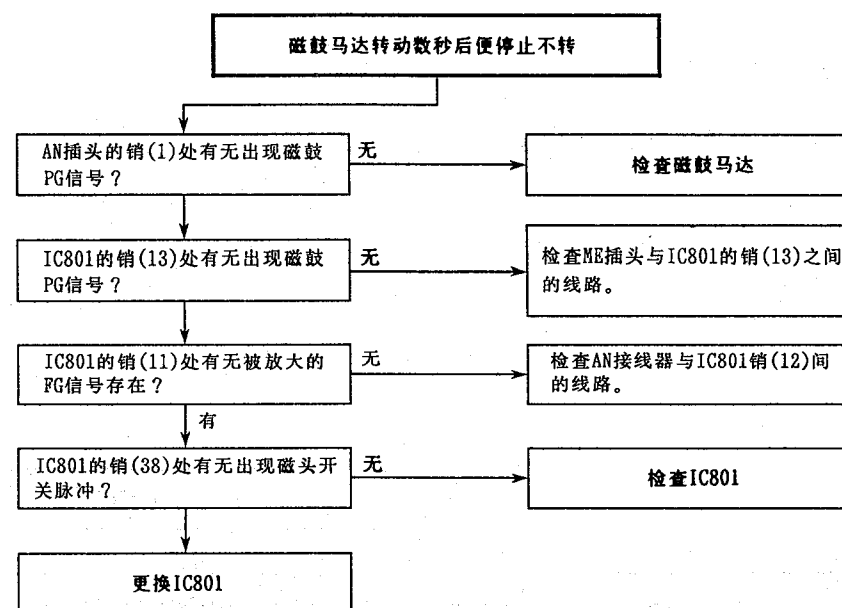
流程图10 主导轴马达的故障检查



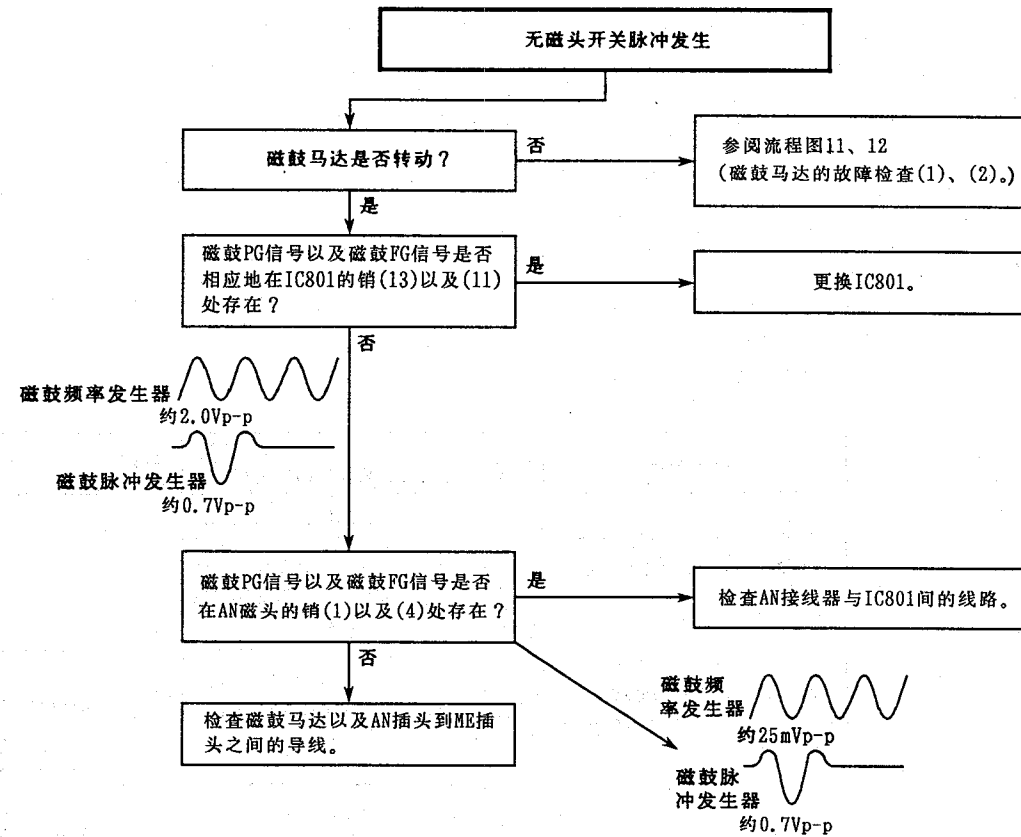
流程图11 磁鼓马达的故障检查(1)



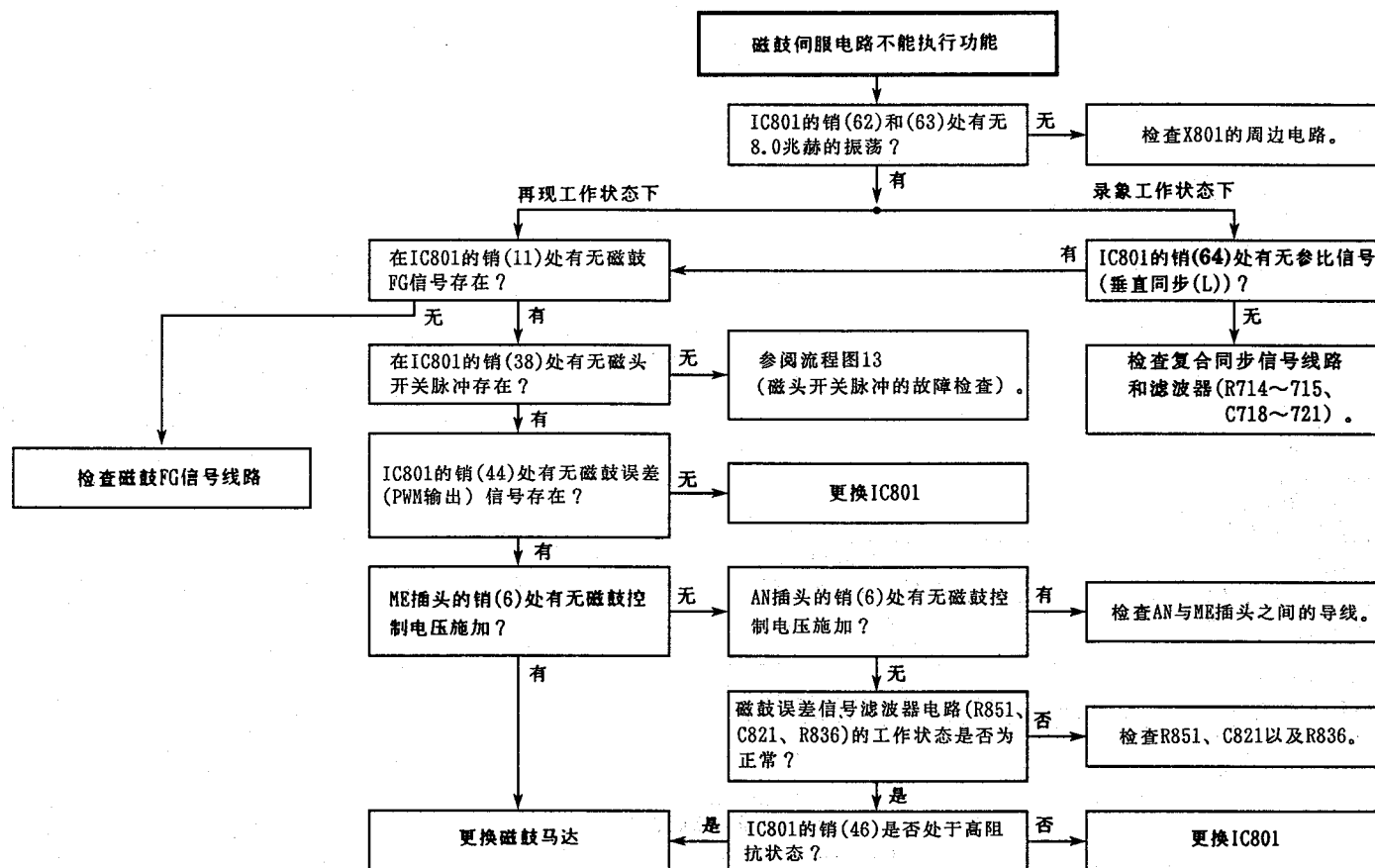
流程图12 磁鼓马达的故障检查(2)



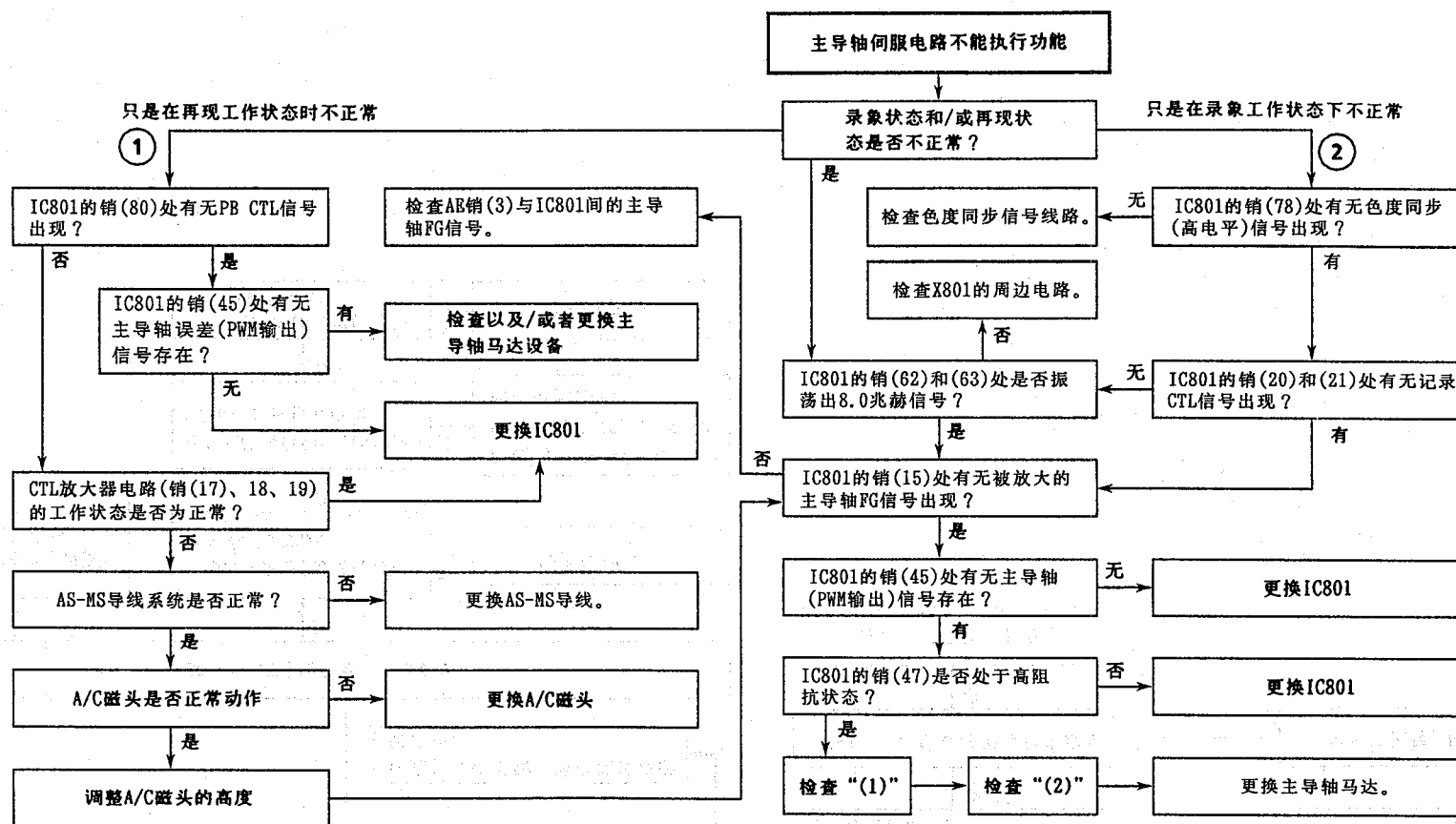
流程图13 磁头开关脉冲的故障检查



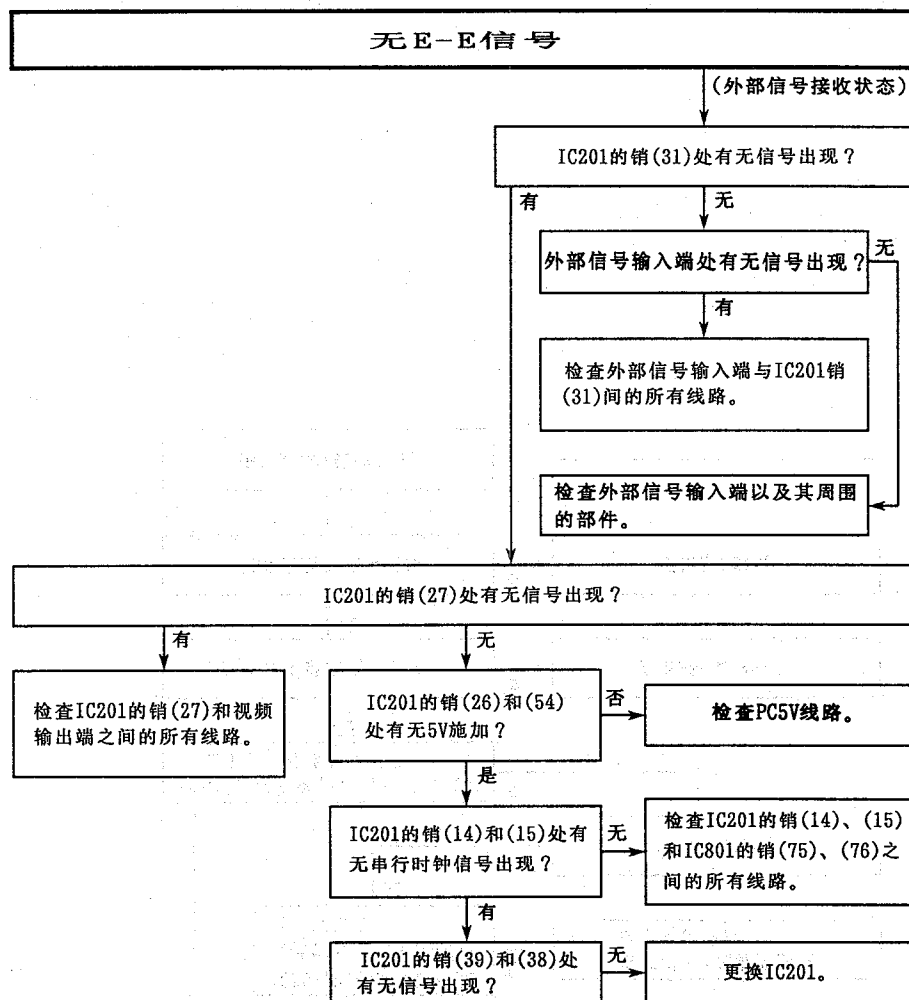
流程图14 磁鼓伺服电路的故障检查



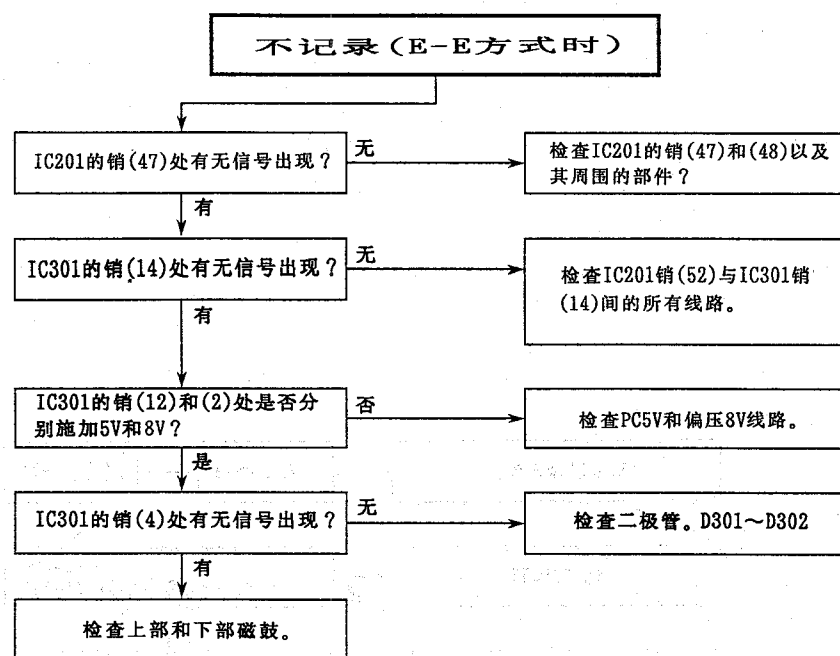
流程图15 主导轴伺服电路的故障检查



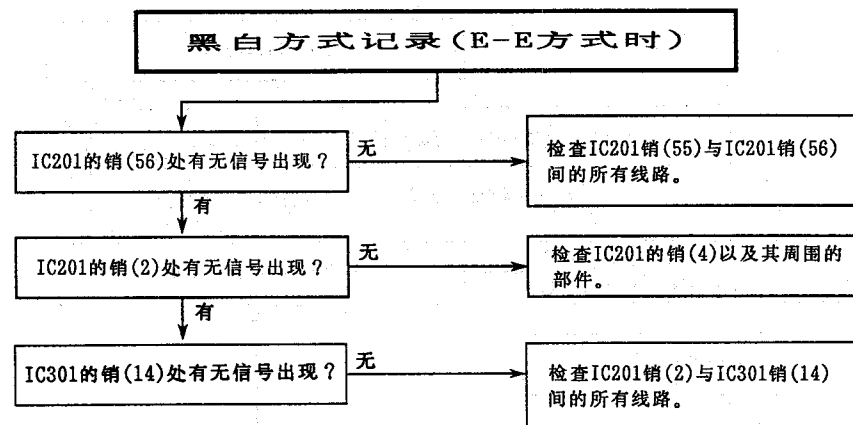
流程图16 E-E方式的故障检查



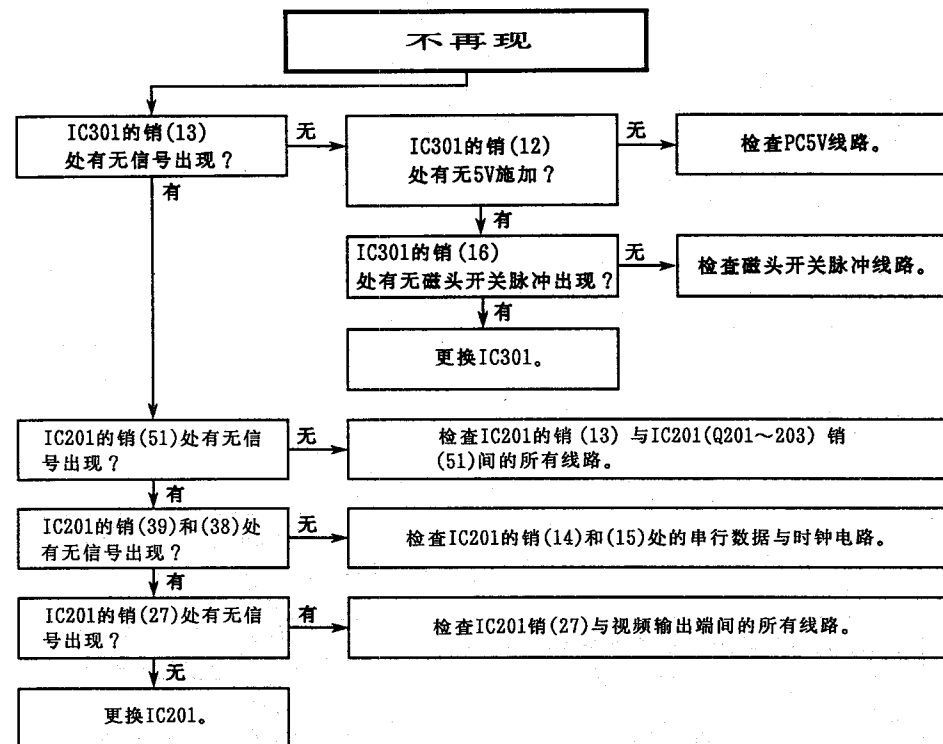
流程图17 记录状态（亮度）的故障检查



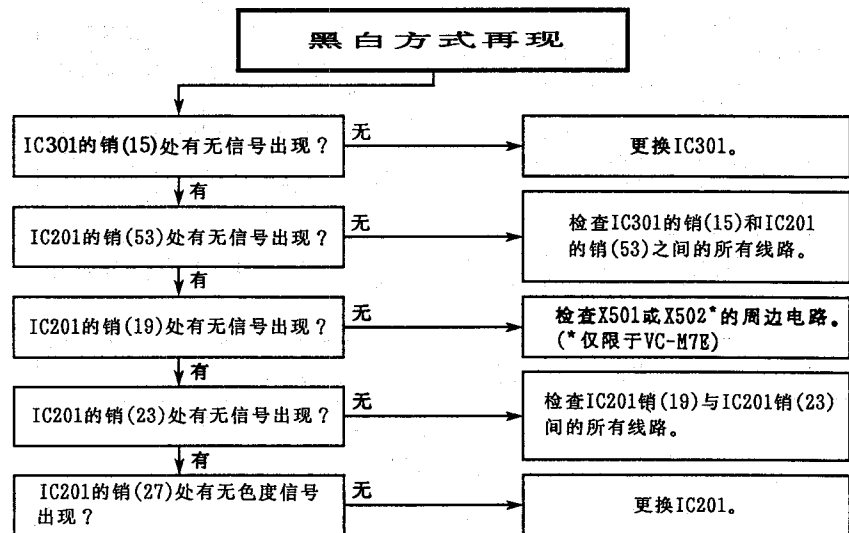
流程图18 记录状态（色度）的故障检查



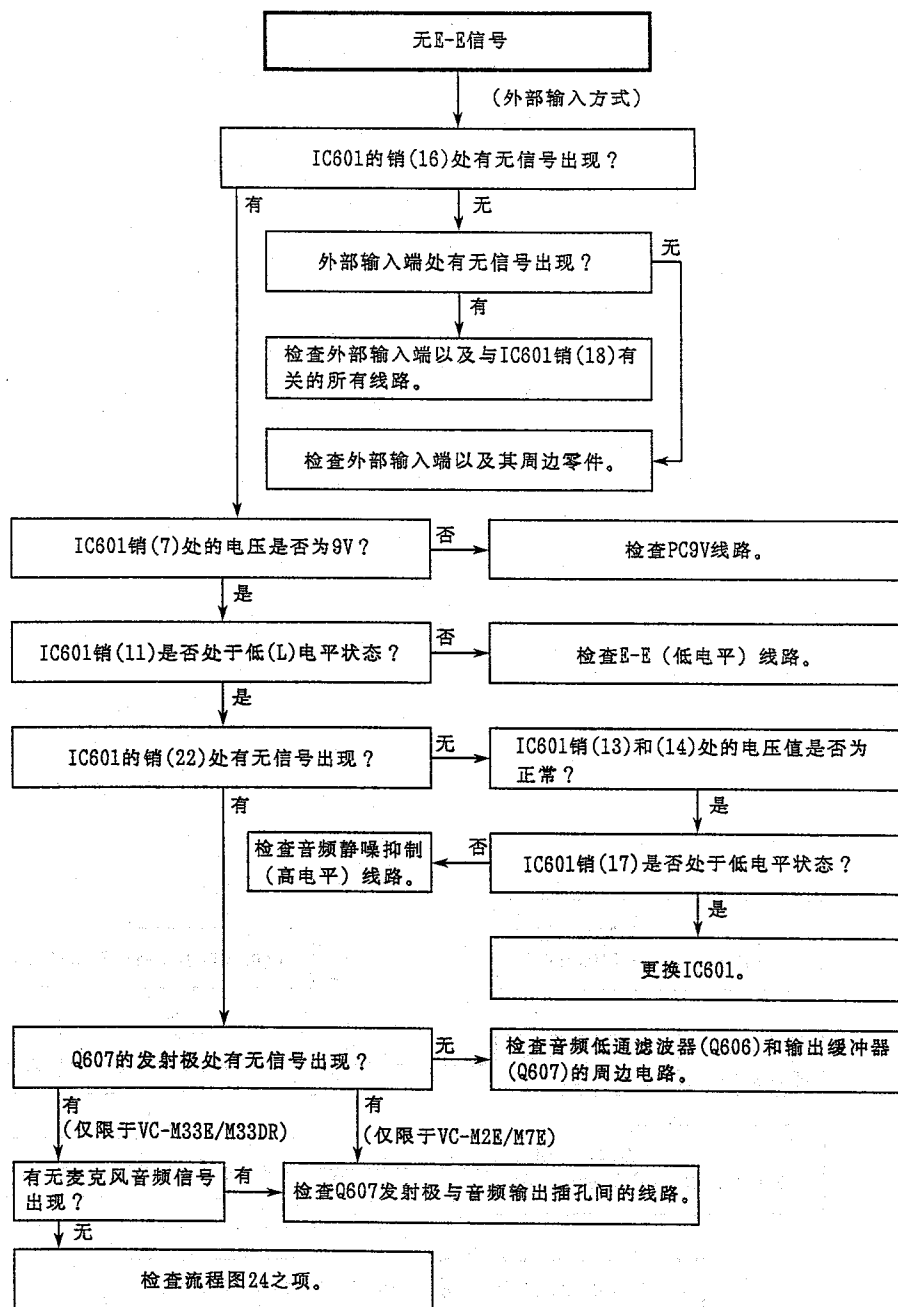
流程图19 再现状态（亮度）的故障检查



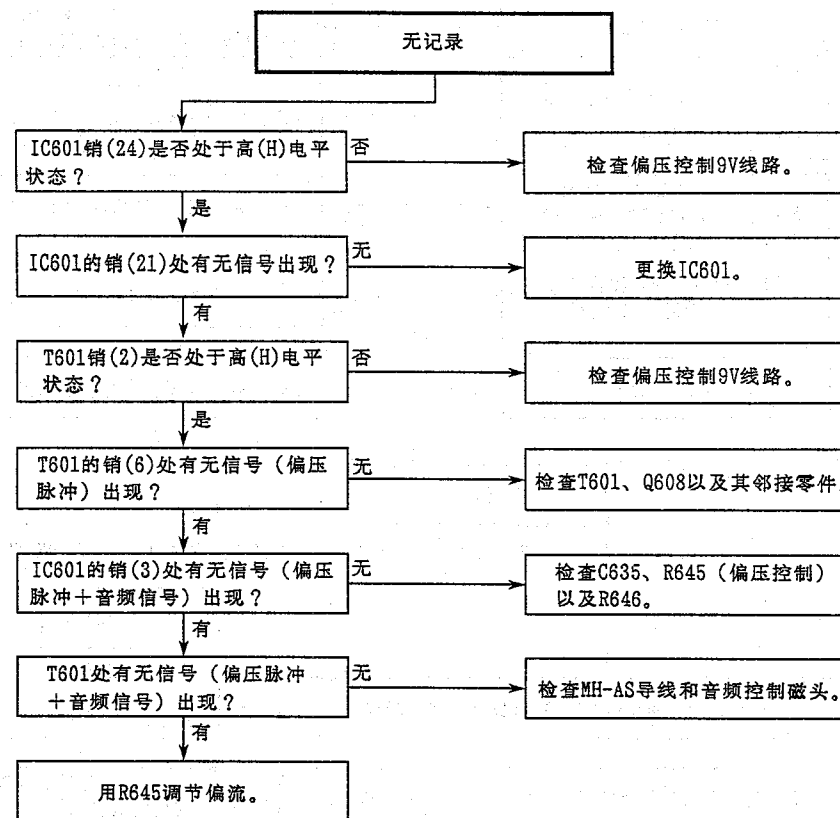
流程图20 再现状态（色度）的故障检查



流程图 21 线性音频E-E方式的故障检修

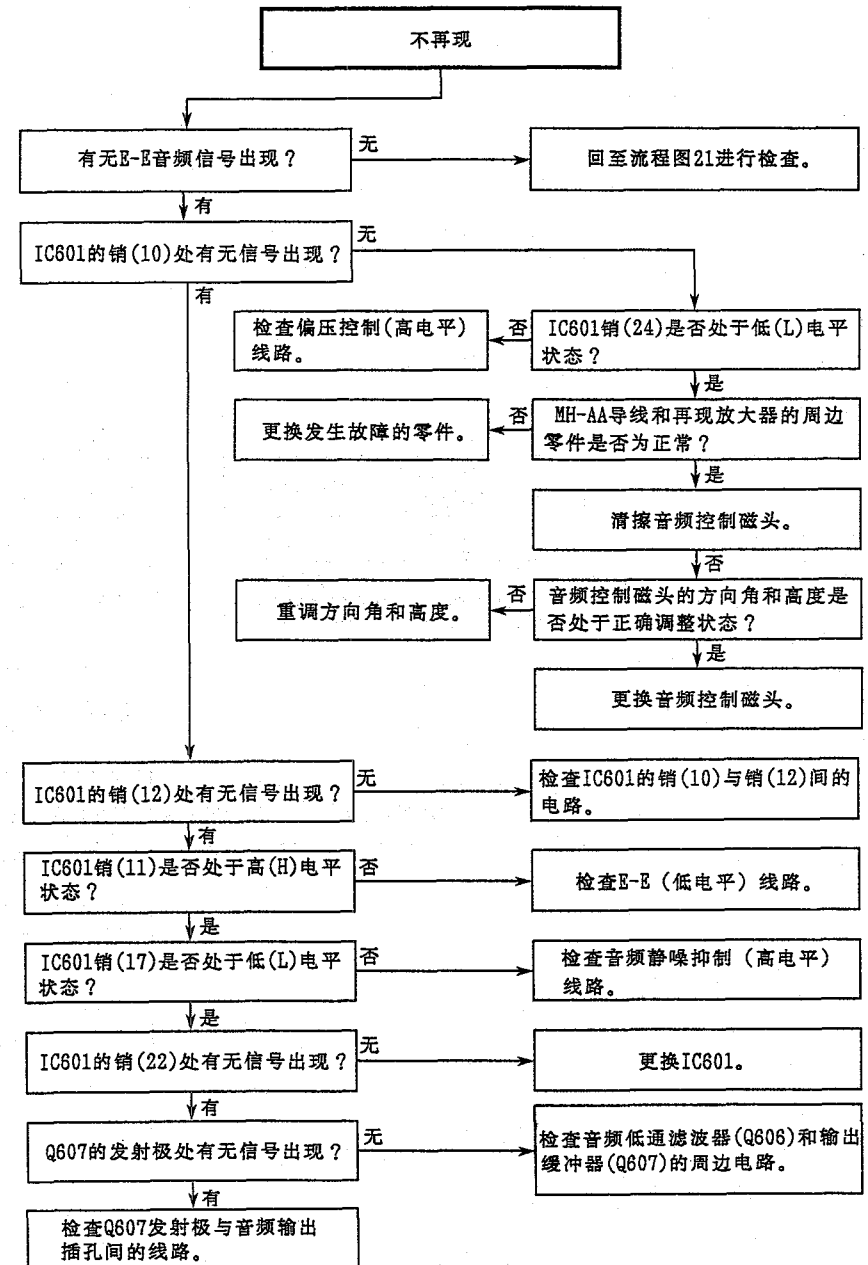


流程图 22 线性音频记录状态的故障检修

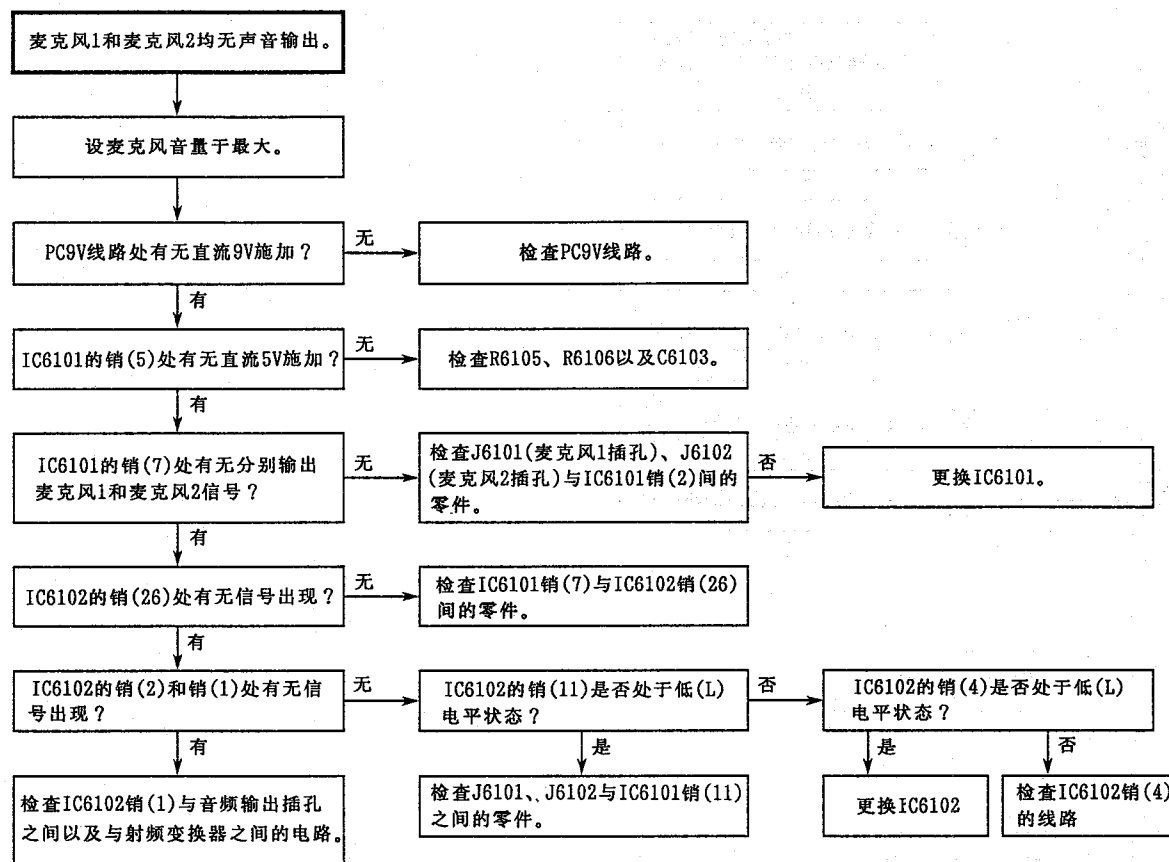




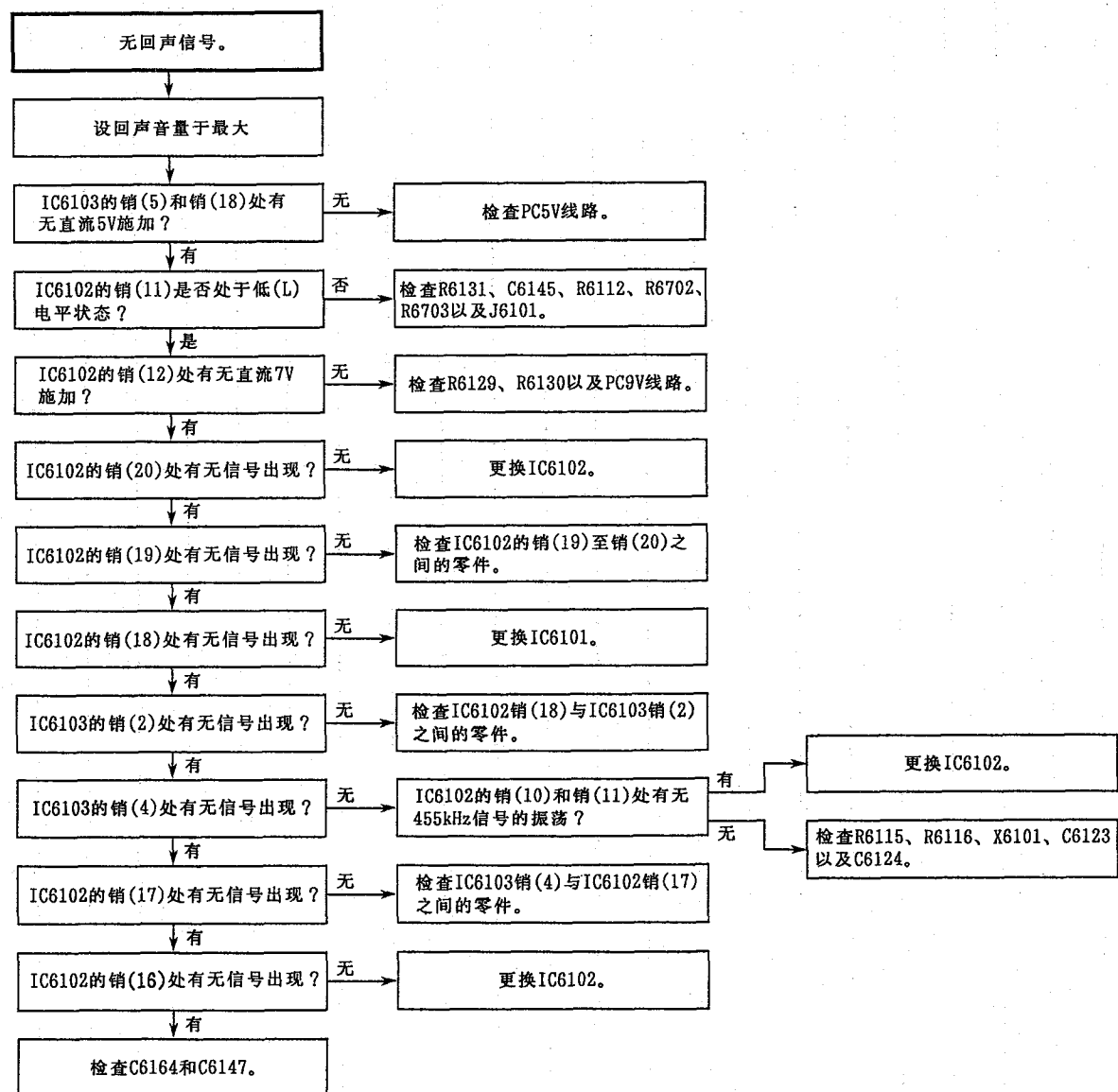
流程图23 线性音频再现状态的故障检修



流程图 24 麦克风电路的故障检修(型号 VC-M33E/M33DR)



流程图 25 回声电路的故障检修 (型号 VC-M33E/M33DR)



# MEMO

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**VC-M2E/M7E**  
**VC-M33E/M33DR**



# SIGNAL FLOW BLOCK DIAGRAM 信号流程方框图

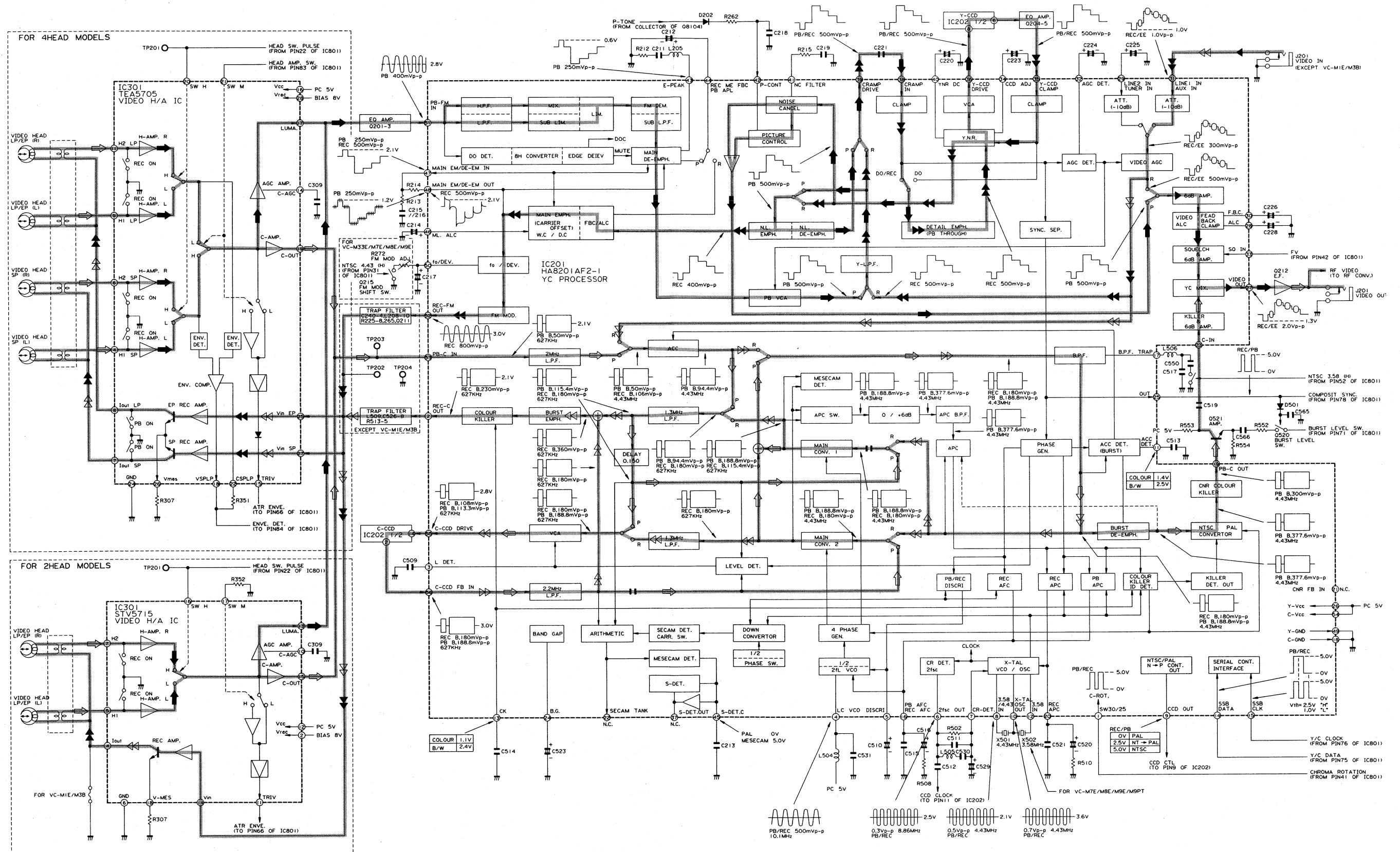
Playback Chrominance Signal  
再现色度信号

Playback Luminance Signal  
再现亮度信号

Recording Chrominance Signal  
记录色度信号

Recording Luminance Signal  
记录亮度信号

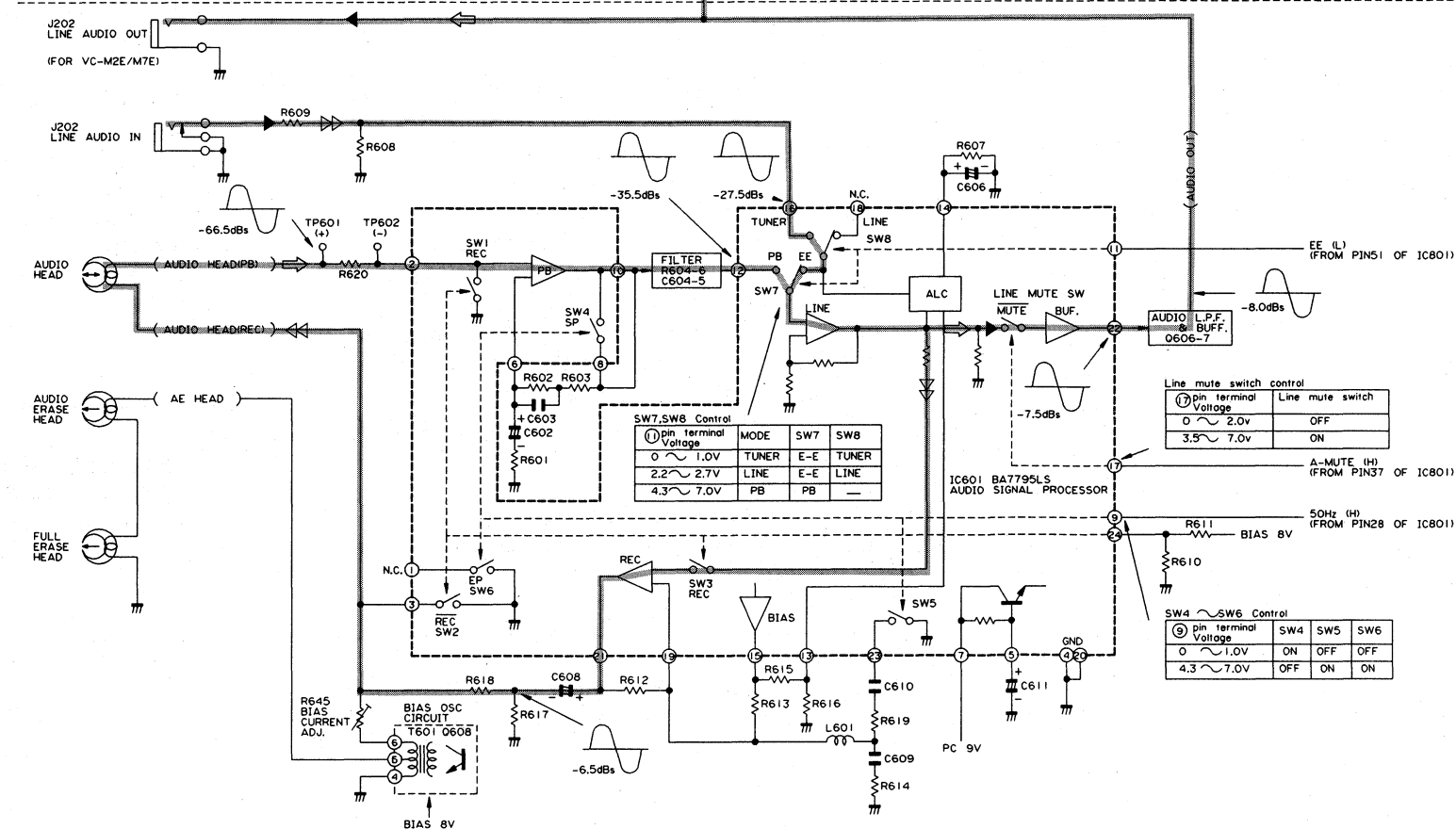
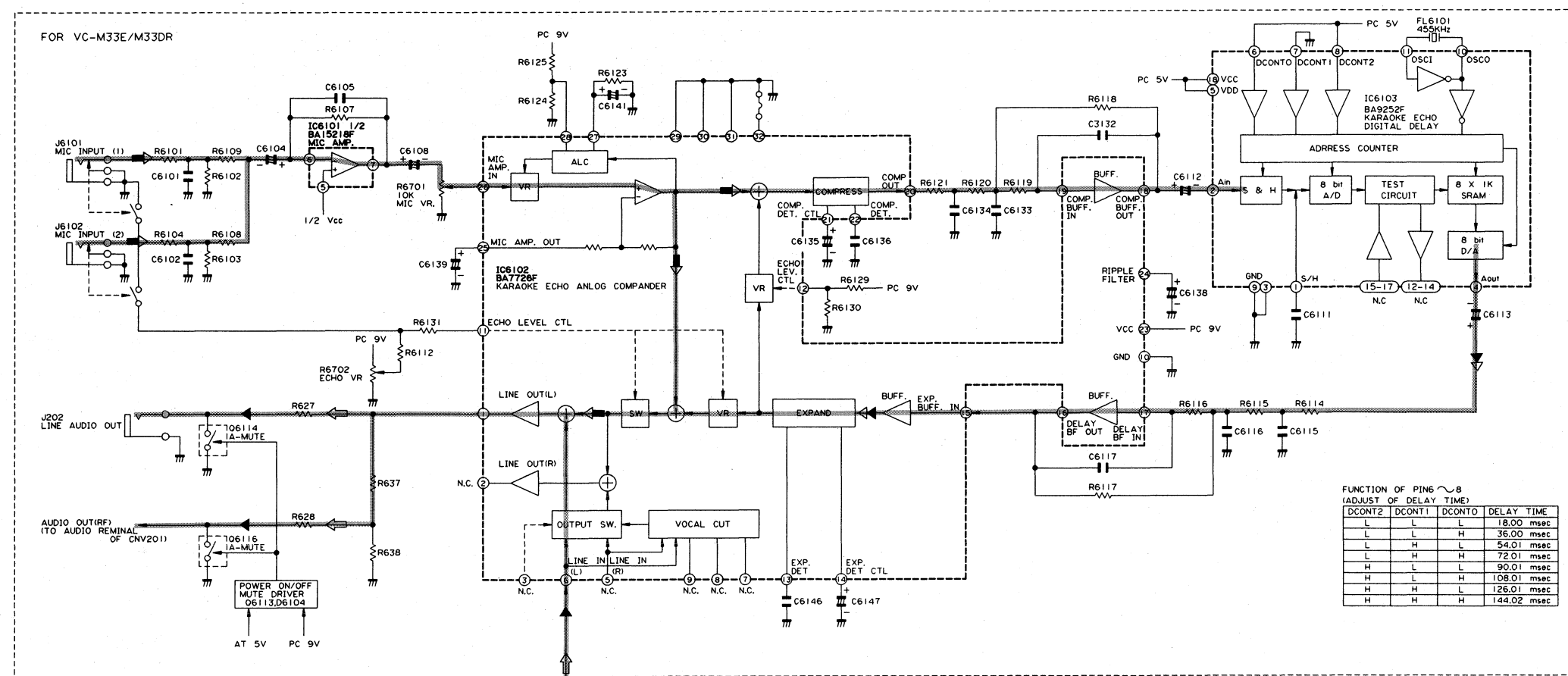
E-E Signal  
E-E信号

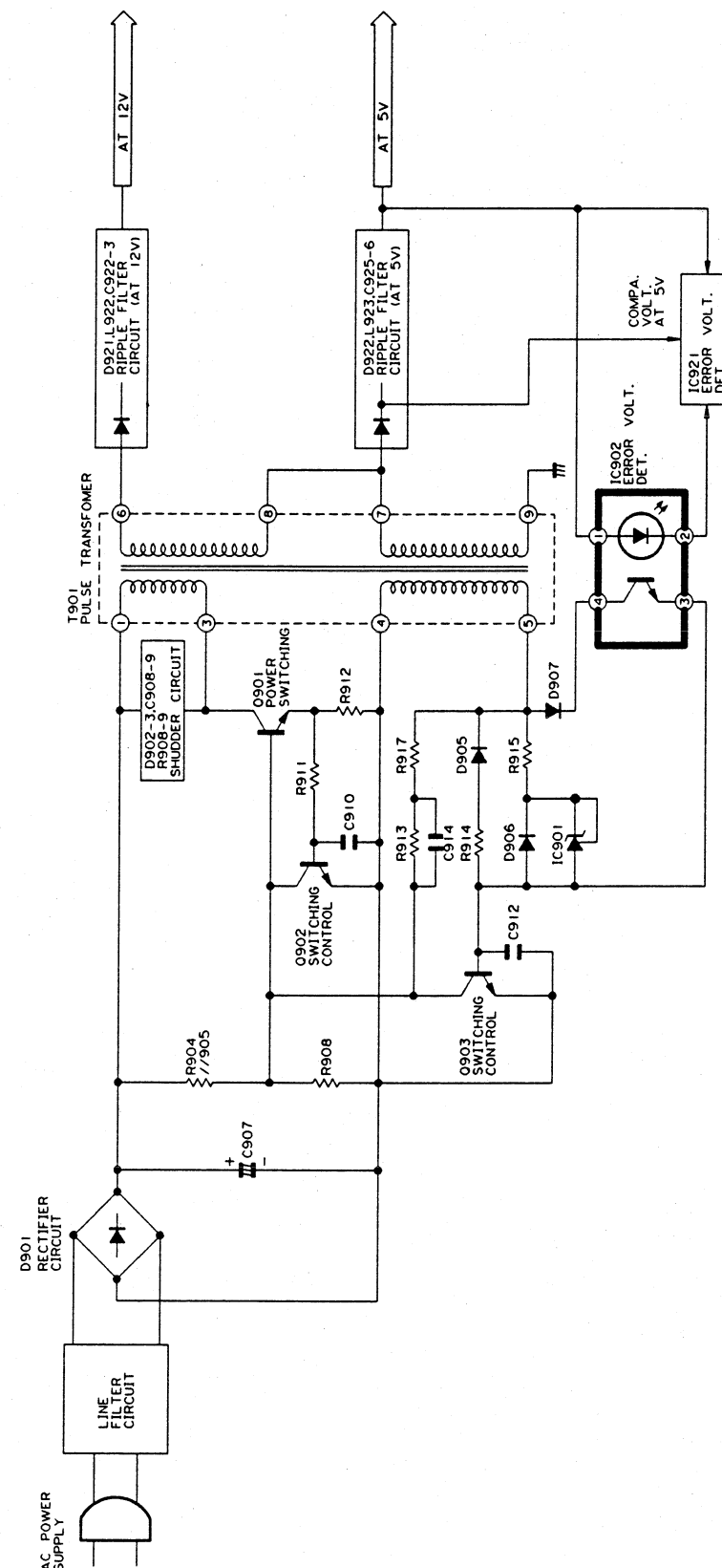


# **AUDIO BLOCK DIAGRAM** 音频装置电路的方框图

VC-M2E/M7E VC-M33E/M33DR VC-M2E/M7E VC-M33E/M33DR

Playback Signal 再现信号 Recording Signal 记录信号 E-E Signal E-E信号 Echo Signal (麦克风)信号 Mic Signal 回声信号



POWER CIRCUIT BLOCK DIAGRAM  
电源电路方框图

SCHEMATIC DIAGRAM

**IMPORTANT SAFETY NOTICE:**  
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "△" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET. BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

**SAFETY NOTES:**  
1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.  
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

**NOTES:**  
1. The unit of resistance "ohm" is omitted ( $k = 1000 \text{ ohm}$ ,  $M = 1 \text{ Meg ohm}$ ).  
2. All resistors are 1/8 watt, unless otherwise noted.  
3. The unit of capacitance "F" is omitted ( $\mu = \mu F$ ,  $p = pF$ ).  
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

**VOLTAGE MEASUREMENT CONDITIONS:**  
1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC110~240V, 50/60Hz (VC-M2E/M7E/M33E), AC200~240V, 50/60Hz (VC-M33DR) supplied to unit and all controls are set to normal viewing picture unless otherwise noted.  
2. Voltages are measured with 10000 $\mu V$  B & W or colour signal.

**WAVEFORM MEASUREMENT CONDITIONS:**  
10000 $\mu V$  87.5 percent modulated colour bar signal is fed into tuner.

**CAUTION:**  
This circuit diagram is original one. Therefore there may be a slight difference from yours.

电路原理图

**安全使用注意要点:**  
为了保证本装置的安全性及可靠性, 务请使用该型号装置的原配零件。  
注有△标记, 以及打有黑色阴影线的部分, 对于保护本装置的安全、保持其使用性能及使用寿命极其重要。  
更换这些部件时, 务请使用规定编号者。

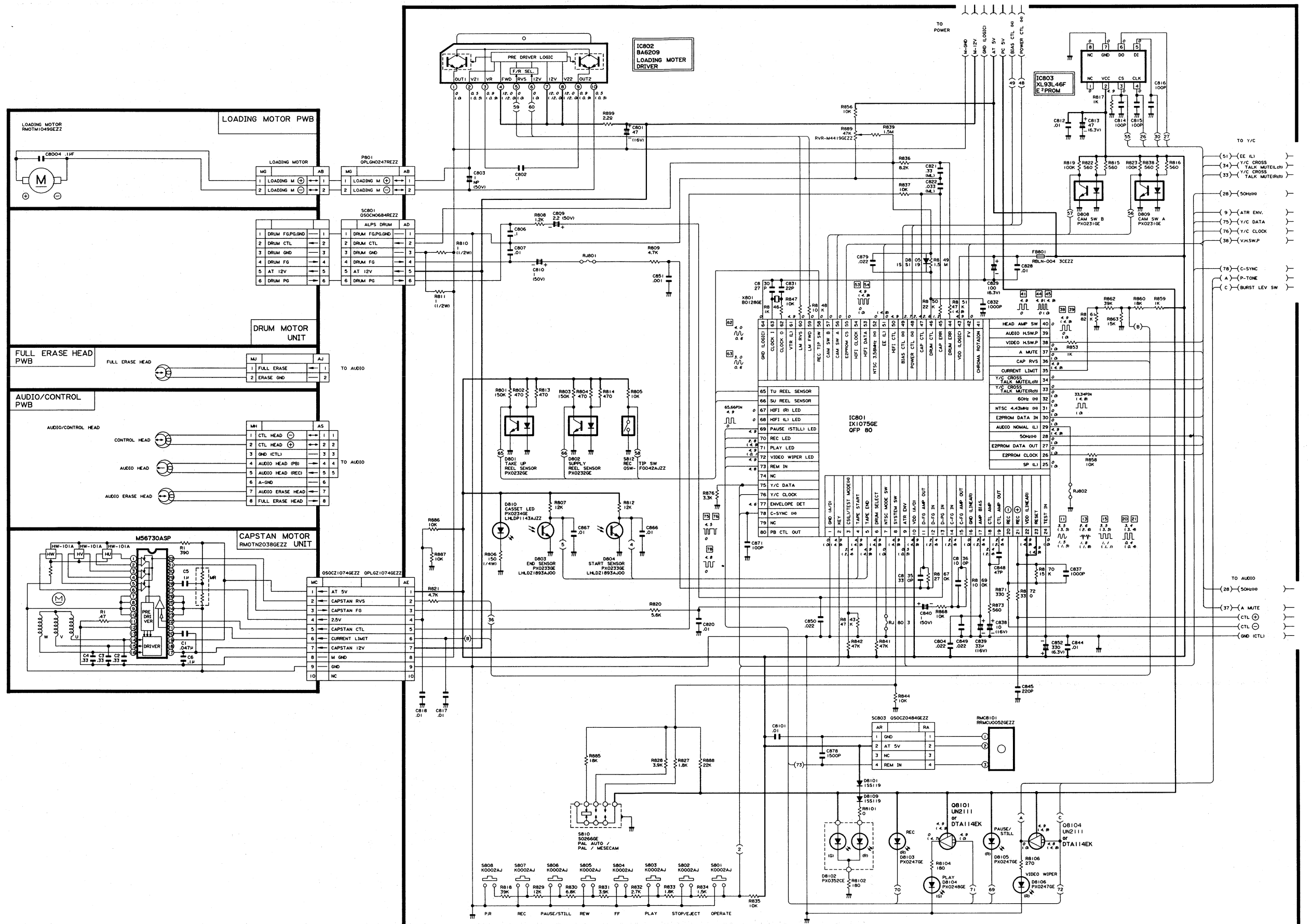
**安全使用注意事项:**  
1. 在进行部件更换之前, 务请拔出电源插头。  
2. 本装置工作时, 机芯底座的半导体散热片有触电之虑, 务请注意。

**电路单位说明:**  
1. 电阻“欧姆”(Ω)单位予以略记(K=千欧, M=兆欧姆)。  
2. 除特别说明者外, 图中电阻功率均为1/8瓦特。  
3. 电容“法拉”(F)单位予以略记( $\mu$ =微法拉, P=微微法拉)。  
4. 在括弧内的数值为PB状态, 无括弧的数值为REC状态。  
**电压测定条件**  
1. 除特别说明者外, 直流电压是以AC110~240V, 50/60Hz(型号VC-M2E/M7E/M33E)、AC200~240V, 50/60Hz(型号VC-M33DR)交流电源供给本装置时, 将所有控制调节都调至正常状态后, 把VTVM(电子管电压表)连接于测点与底盘接地之间所得的读数。  
2. 电压由10000 $\mu V$ 黑白或彩色信号测定。  
**波形测定条件:**  
向调谐器输入10000 $\mu V$ 的87.5%调制色带信号的状态时进行测量。

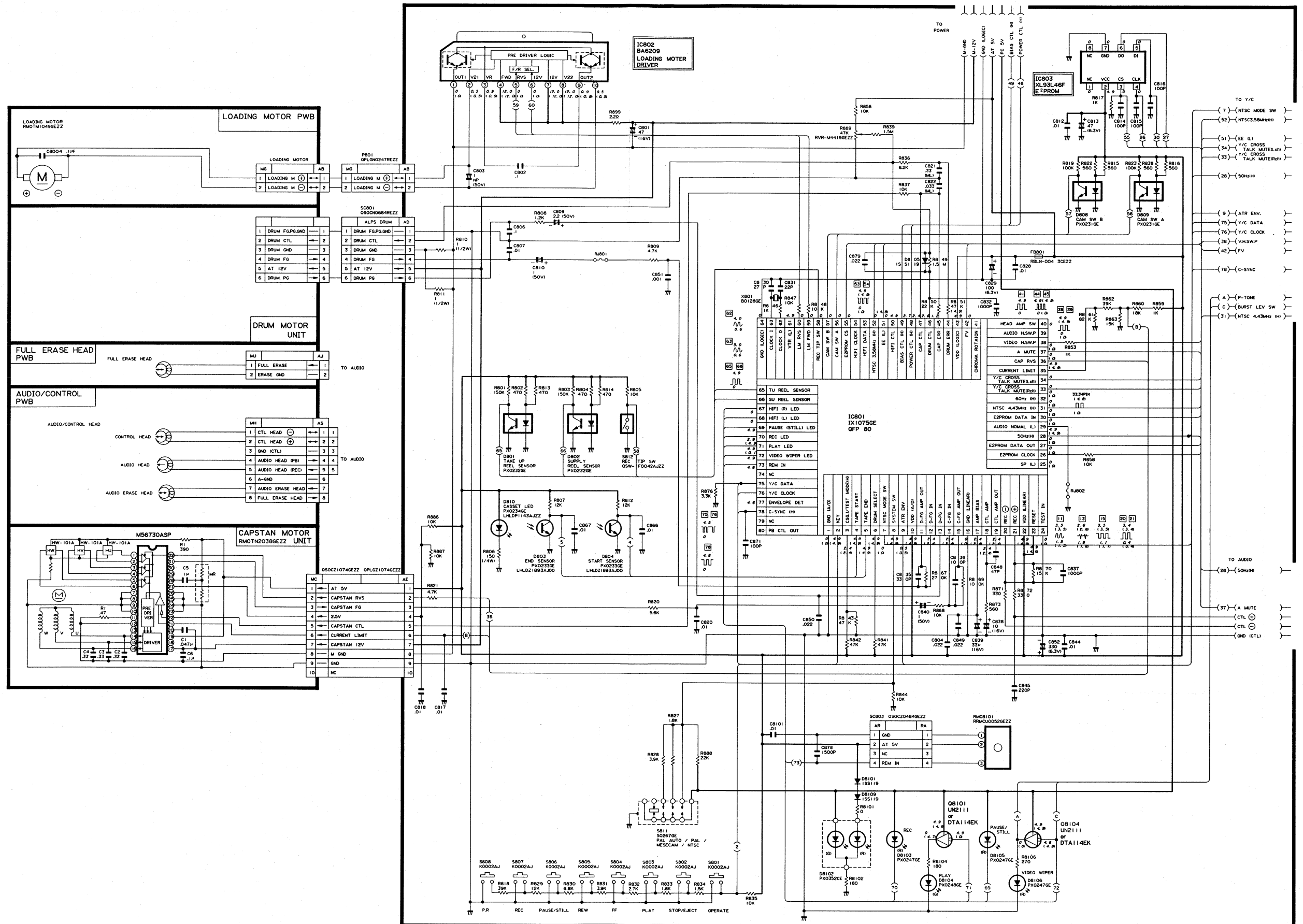
**注意:**  
这里的电路原理图均为最初设计原图, 与您的机器的电路原理图可能有不同之处。



## 9. CIRCUIT DIAGRAM AND PWB FOIL PATTERN

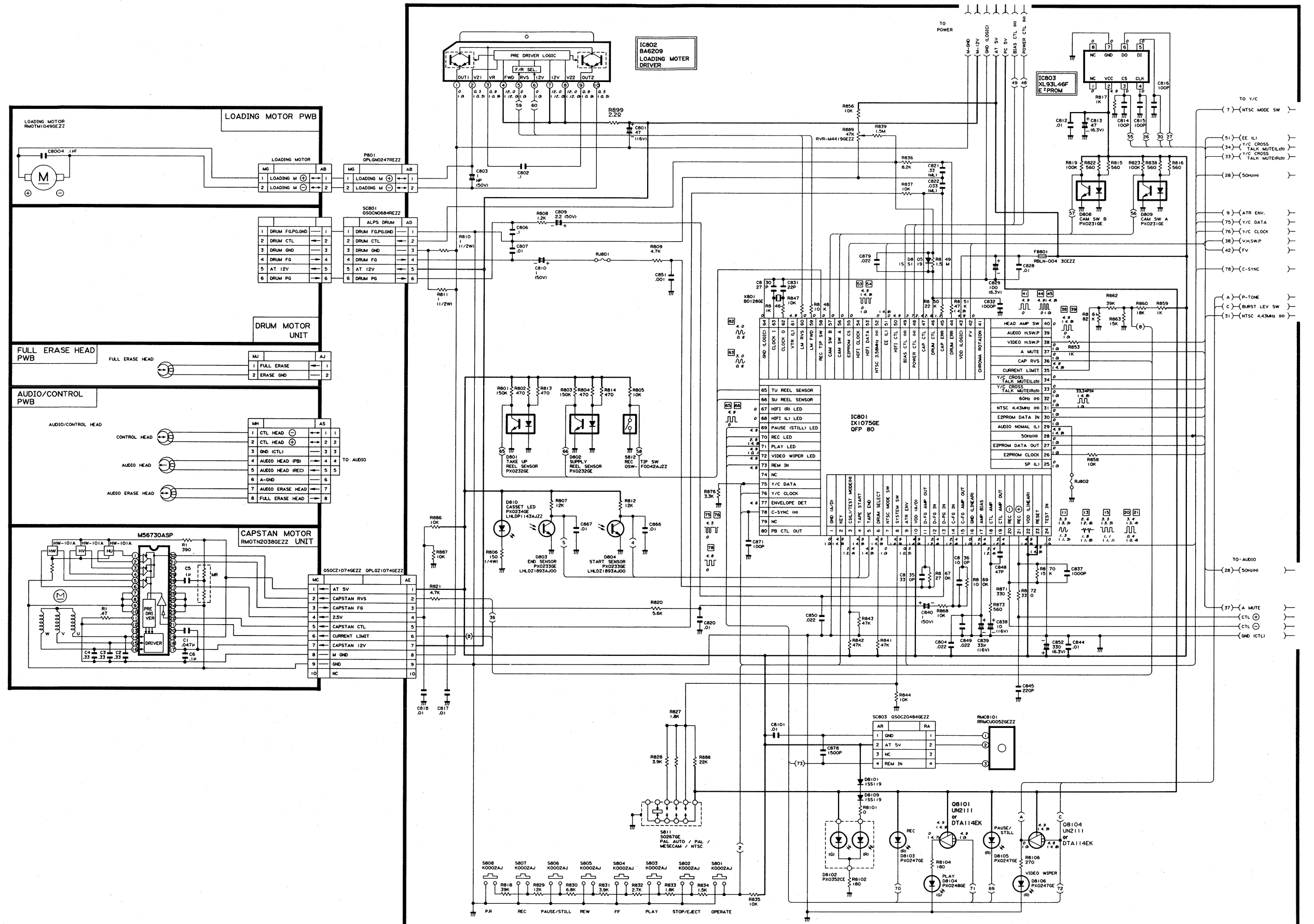


MAIN (1) CIRCUIT 主电路(1) [VC-M7E]

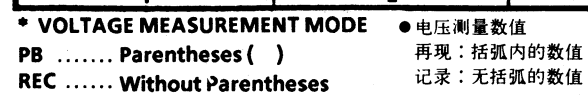


# MAIN (1) CIRCUIT 主电路(1) [VC-M33E]

VC-M2E/M7E VC-M33E/M33DR  
VC-M2E/M7E VC-M33E/M33DR



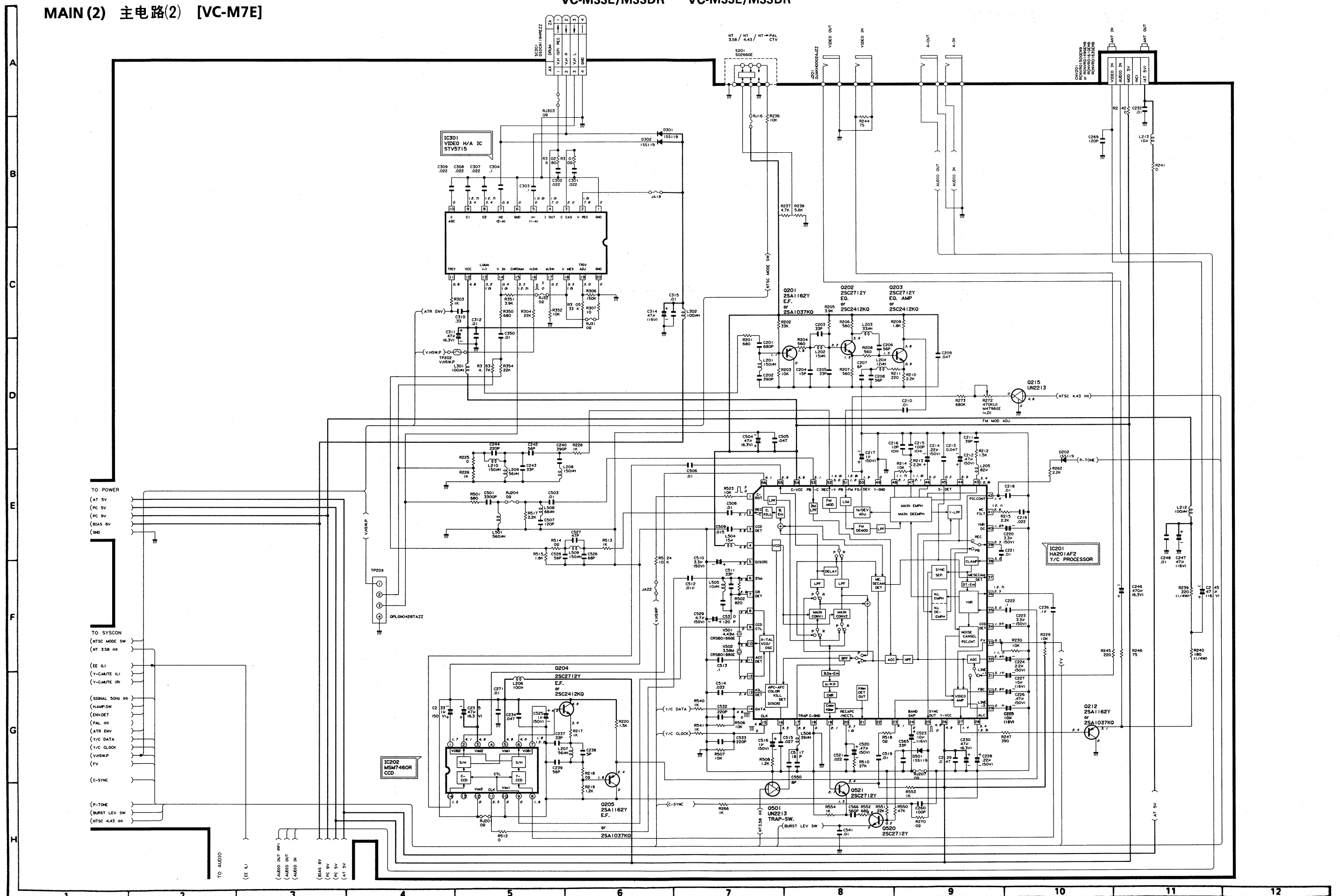
**VC-M2E/M7E**      **VC-M2E/M7E**  
**VC-M33E/M33DR**   **VC-M33E/M33DR**



# MAIN (2) 主电路(2) [VC-M7E]

VC-M2E/M7E  
VC-M33E/M33DR

VC-M2E/M7E  
VC-M33E/M33DR

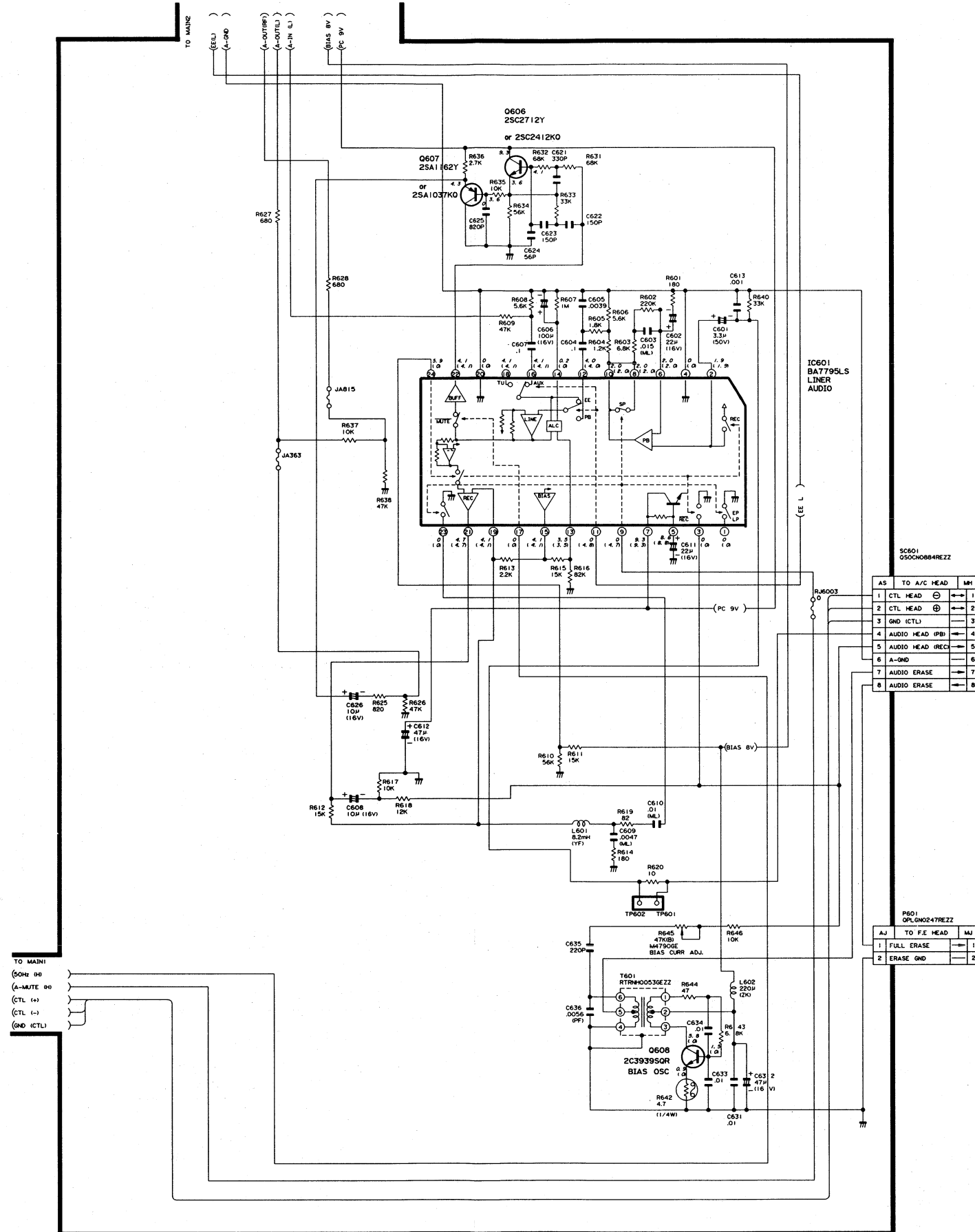


\* VOLTAGE MEASUREMENT MODE  
PB ..... Parentheses ( )  
REC ..... Without Parentheses

● 电压测量数值  
再现：括弧内的数值  
记录：无括弧的数值

# MAIN (3) CIRCUIT 主电路(3) [VC-M2E/M7E]

VC-M2E/M7E VC-M33E/M33DR VC-M2E/M7E VC-M33E/M33DR



The schematic diagram illustrates the internal electronics of a portable cassette recorder, specifically focusing on the audio processing and control sections. Key components include:

- IC6101**: BA1521BF MIC AMP, used for microphone amplification.
- IC6102**: BA7726F ECHO MIX, responsible for mixing the original signal with an echo effect.
- IC6103**: BA9252F ECHO, another component related to the echo function.
- IC6104**: BA1521BF MIC AMP, second instance of the microphone amplifier.
- IC6105**: BA1521BF MIC AMP, third instance of the microphone amplifier.
- IC6106**: BA1521BF MIC AMP, fourth instance of the microphone amplifier.
- IC6107**: BA1521BF MIC AMP, fifth instance of the microphone amplifier.
- IC6108**: BA1521BF MIC AMP, sixth instance of the microphone amplifier.
- IC6109**: BA1521BF MIC AMP, seventh instance of the microphone amplifier.
- IC6110**: BA1521BF MIC AMP, eighth instance of the microphone amplifier.
- IC6111**: BA1521BF MIC AMP, ninth instance of the microphone amplifier.
- IC6112**: BA1521BF MIC AMP, tenth instance of the microphone amplifier.
- IC6113**: BA1521BF MIC AMP, eleventh instance of the microphone amplifier.
- IC6114**: BA1521BF MIC AMP, twelfth instance of the microphone amplifier.
- IC6115**: BA1521BF MIC AMP, thirteenth instance of the microphone amplifier.
- IC6116**: BA1521BF MIC AMP, fourteenth instance of the microphone amplifier.
- IC6117**: BA1521BF MIC AMP, fifteenth instance of the microphone amplifier.
- IC6118**: BA1521BF MIC AMP, sixteenth instance of the microphone amplifier.
- IC6119**: BA1521BF MIC AMP, seventeenth instance of the microphone amplifier.
- IC6120**: BA1521BF MIC AMP, eighteenth instance of the microphone amplifier.
- IC6121**: BA1521BF MIC AMP, nineteenth instance of the microphone amplifier.
- IC6122**: BA1521BF MIC AMP, twentieth instance of the microphone amplifier.
- IC6123**: BA1521BF MIC AMP, twenty-first instance of the microphone amplifier.
- IC6124**: BA1521BF MIC AMP, twenty-second instance of the microphone amplifier.
- IC6125**: BA1521BF MIC AMP, twenty-third instance of the microphone amplifier.
- IC6126**: BA1521BF MIC AMP, twenty-fourth instance of the microphone amplifier.
- IC6127**: BA1521BF MIC AMP, twenty-fifth instance of the microphone amplifier.
- IC6128**: BA1521BF MIC AMP, twenty-sixth instance of the microphone amplifier.
- IC6129**: BA1521BF MIC AMP, twenty-seventh instance of the microphone amplifier.
- IC6130**: BA1521BF MIC AMP, twenty-eighth instance of the microphone amplifier.
- IC6131**: BA1521BF MIC AMP, twenty-ninth instance of the microphone amplifier.
- IC6132**: BA1521BF MIC AMP, thirtieth instance of the microphone amplifier.
- IC6133**: BA1521BF MIC AMP, thirty-first instance of the microphone amplifier.
- IC6134**: BA1521BF MIC AMP, thirty-second instance of the microphone amplifier.
- IC6135**: BA1521BF MIC AMP, thirty-third instance of the microphone amplifier.
- IC6136**: BA1521BF MIC AMP, thirty-fourth instance of the microphone amplifier.
- IC6137**: BA1521BF MIC AMP, thirty-fifth instance of the microphone amplifier.
- IC6138**: BA1521BF MIC AMP, thirty-sixth instance of the microphone amplifier.
- IC6139**: BA1521BF MIC AMP, thirty-seventh instance of the microphone amplifier.
- IC6140**: BA1521BF MIC AMP, thirty-eighth instance of the microphone amplifier.
- IC6141**: BA1521BF MIC AMP, thirty-ninth instance of the microphone amplifier.
- IC6142**: BA1521BF MIC AMP, fortieth instance of the microphone amplifier.
- IC6143**: BA1521BF MIC AMP, forty-first instance of the microphone amplifier.
- IC6144**: BA1521BF MIC AMP, forty-second instance of the microphone amplifier.
- IC6145**: BA1521BF MIC AMP, forty-third instance of the microphone amplifier.
- IC6146**: BA1521BF MIC AMP, forty-fourth instance of the microphone amplifier.
- IC6147**: BA1521BF MIC AMP, forty-fifth instance of the microphone amplifier.
- IC6148**: BA1521BF MIC AMP, forty-sixth instance of the microphone amplifier.
- IC6149**: BA1521BF MIC AMP, forty-seventh instance of the microphone amplifier.
- IC6150**: BA1521BF MIC AMP, forty-eighth instance of the microphone amplifier.
- IC6151**: BA1521BF MIC AMP, forty-ninth instance of the microphone amplifier.
- IC6152**: BA1521BF MIC AMP, fiftieth instance of the microphone amplifier.
- IC6153**: BA1521BF MIC AMP, fifty-first instance of the microphone amplifier.
- IC6154**: BA1521BF MIC AMP, fifty-second instance of the microphone amplifier.
- IC6155**: BA1521BF MIC AMP, fifty-third instance of the microphone amplifier.
- IC6156**: BA1521BF MIC AMP, fifty-fourth instance of the microphone amplifier.
- IC6157**: BA1521BF MIC AMP, fifty-fifth instance of the microphone amplifier.
- IC6158**: BA1521BF MIC AMP, fifty-sixth instance of the microphone amplifier.
- IC6159**: BA1521BF MIC AMP, fifty-seventh instance of the microphone amplifier.
- IC6160**: BA1521BF MIC AMP, fifty-eighth instance of the microphone amplifier.
- IC6161**: BA1521BF MIC AMP, fifty-ninth instance of the microphone amplifier.
- IC6162**: BA1521BF MIC AMP, sixtyth instance of the microphone amplifier.
- IC6163**: BA1521BF MIC AMP, sixty-first instance of the microphone amplifier.
- IC6164**: BA1521BF MIC AMP, sixty-second instance of the microphone amplifier.
- IC6165**: BA1521BF MIC AMP, sixty-third instance of the microphone amplifier.
- IC6166**: BA1521BF MIC AMP, sixty-fourth instance of the microphone amplifier.
- IC6167**: BA1521BF MIC AMP, sixty-fifth instance of the microphone amplifier.
- IC6168**: BA1521BF MIC AMP, sixty-sixth instance of the microphone amplifier.
- IC6169**: BA1521BF MIC AMP, sixty-seventh instance of the microphone amplifier.
- IC6170**: BA1521BF MIC AMP, sixty-eighth instance of the microphone amplifier.
- IC6171**: BA1521BF MIC AMP, sixty-ninth instance of the microphone amplifier.
- IC6172**: BA1521BF MIC AMP, seventieth instance of the microphone amplifier.
- IC6173**: BA1521BF MIC AMP, seventy-first instance of the microphone amplifier.
- IC6174**: BA1521BF MIC AMP, seventy-second instance of the microphone amplifier.
- IC6175**: BA1521BF MIC AMP, seventy-third instance of the microphone amplifier.
- IC6176**: BA1521BF MIC AMP, seventy-fourth instance of the microphone amplifier.
- IC6177**: BA1521BF MIC AMP, seventy-fifth instance of the microphone amplifier.
- IC6178**: BA1521BF MIC AMP, seventy-sixth instance of the microphone amplifier.
- IC6179**: BA1521BF MIC AMP, seventy-seventh instance of the microphone amplifier.
- IC6180**: BA1521BF MIC AMP, seventy-eighth instance of the microphone amplifier.
- IC6181**: BA1521BF MIC AMP, seventy-ninth instance of the microphone amplifier.
- IC6182**: BA1521BF MIC AMP, eightyth instance of the microphone amplifier.
- IC6183**: BA1521BF MIC AMP, eighty-first instance of the microphone amplifier.
- IC6184**: BA1521BF MIC AMP, eighty-second instance of the microphone amplifier.
- IC6185**: BA1521BF MIC AMP, eighty-third instance of the microphone amplifier.
- IC6186**: BA1521BF MIC AMP, eighty-fourth instance of the microphone amplifier.
- IC6187**: BA1521BF MIC AMP, eighty-fifth instance of the microphone amplifier.
- IC6188**: BA1521BF MIC AMP, eighty-sixth instance of the microphone amplifier.
- IC6189**: BA1521BF MIC AMP, eighty-seventh instance of the microphone amplifier.
- IC6190**: BA1521BF MIC AMP, eighty-eighth instance of the microphone amplifier.
- IC6191**: BA1521BF MIC AMP, eighty-ninth instance of the microphone amplifier.
- IC6192**: BA1521BF MIC AMP, ninetieth instance of the microphone amplifier.
- IC6193**: BA1521BF MIC AMP, ninety-first instance of the microphone amplifier.
- IC6194**: BA1521BF MIC AMP, ninety-second instance of the microphone amplifier.
- IC6195**: BA1521BF MIC AMP, ninety-third instance of the microphone amplifier.
- IC6196**: BA1521BF MIC AMP, ninety-fourth instance of the microphone amplifier.
- IC6197**: BA1521BF MIC AMP, ninety-fifth instance of the microphone amplifier.
- IC6198**: BA1521BF MIC AMP, ninety-sixth instance of the microphone amplifier.
- IC6199**: BA1521BF MIC AMP, ninety-seventh instance of the microphone amplifier.
- IC6200**: BA1521BF MIC AMP, ninety-eighth instance of the microphone amplifier.
- IC6201**: BA1521BF MIC AMP, ninety-ninth instance of the microphone amplifier.
- IC6202**: BA1521BF MIC AMP, one hundredth instance of the microphone amplifier.

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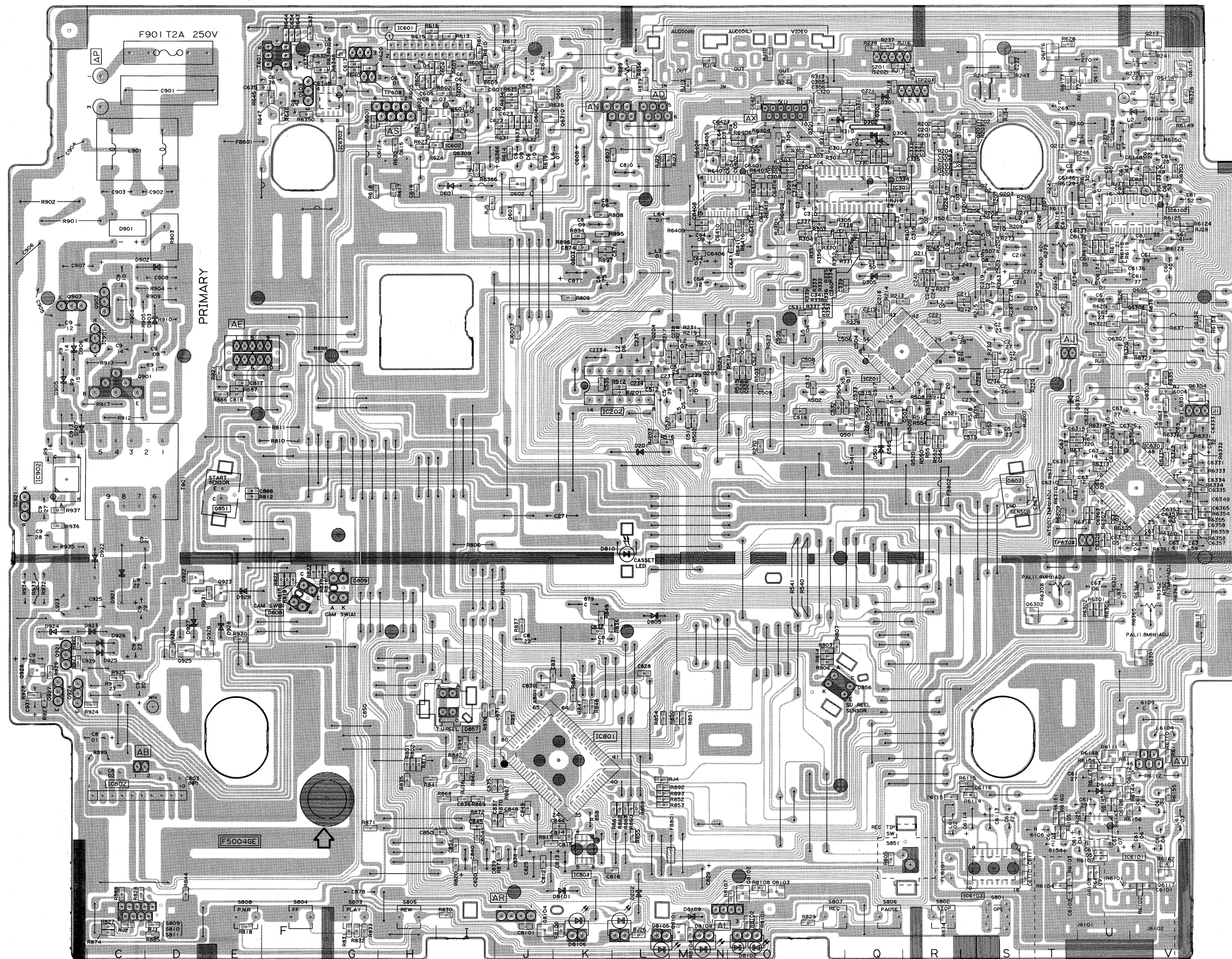




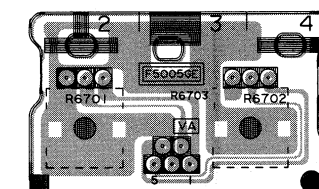
PWB FOIL PATTERN 印刷电路板图案

VC-M2E/M7E  
VC-M33E/M33DR

VC-M2E/M7E  
VC-M33E/M33DR



MAIN PWB 主电路印刷电路图



KARAOKE PWB  
卡拉OK电路印刷电路板  
(VC-M33E/M33DE)

## 10. REPLACEMENT PARTS LIST

### PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette player have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by  $\Delta$  and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

#### "HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |
| 5. PRICE CODE   |                |

### HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING

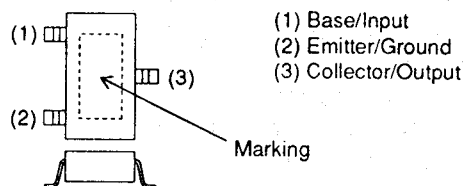


Fig. 1

Package	Marking	Parts No.
Fig. 1	SY	VS2SA1162Y/-1
Fig. 1	LY	VS2SC2712Y/-1
Fig. 1	6C	VSUN2113///-1
Fig. 1	6A	VSUN2111///-1
Fig. 1	6B	VSUN2112///-1
Fig. 1	8C	VSUN2213///-1

MARK  $\star$ : SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	$\star$	Description	Code
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### PRINTED WIRING BOARD ASSEMBLIES

(NOT REPLACEMENT ITEM)

DUNTK5004XM51	-	Main Unit (VC-M2E)	—
DUNTK5004XM54	-	Main Unit (VC-M7E)	—
DUNTK5004XM53	-	Main Unit (VC-M33E)	—
DUNTK5004XM55	-	Main Unit (VC-M33DR)	—
DUNTK5005XM50	-	Karaoke Unit (VC-M33E/M33DR)	—

Ref. No.	Part No.	$\star$	Description	Code
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### DUNTK5004XM51 (VC-M2E)

### DUNTK5004XM54 (VC-M7E)

### DUNTK5004XM53 (VC-M33E)

### DUNTK5004XM55 (VC-M33DR)

#### MAIN UNIT

#### TUNER AND ASSEMBLY

CNV201	RCNVR0150GEN9	J	Converter (VC-M2E/M7E/M33E)	AZ
CNV201	RCNVR0157GEN8	J	Converter (VC-M33DR)	AY

#### INTEGRATED CIRCUITS

IC201	VH1HA201AF2-1	J	Y/C Processor	AW
IC202	VH1MSM7461R-1	J	CCD (VC-M2E/M33E/M33DR)	AP
IC202	VH1MSM7460R-1	J	CCD (VC-M7E)	AP
IC301	VH1STV5715/-1	J	Video H/A	AH
IC601	VH1BA7795LS-1	J	Audio REC/PB Amp	AG
IC801	RH-iX1075GEZZ	J	Syscon/Servo	AX
IC802	VH1BA6209//1	J	Loading Motor Driver	AK
IC803	VH1XL93L46F-1	J	E <sup>2</sup> PROM	AG
$\Delta$ IC901	VH1KiA431//1	J		AE
$\Delta$ IC921	VH1KiA431//1	J		AE
IC6101	VH1BA15218F1E	J	Mic Amp (VC-M33E/M33DR)	AF
IC6102	VH1BA7726FS-1	J	Echo Mix (VC-M33E/M33DR)	AN
IC6103	VH1BU9252F/-1	J	Echo (VC-M33E/M33DR)	AP

#### TRANSISTORS

Q201	VS2SA1162Y/-1	J	2SA1162Y	AB
Q202	VS2SC2712Y/-1	J	2SC2712Y	AB
Q203	VS2SC2712Y/-1	J	2SC2712Y	AB
Q204	VS2SC2712Y/-1	J	2SC2712Y	AB
Q205	VS2SA1162Y/-1	J	2SA1162Y	AB
Q212	VS2SA1162Y/-1	J	2SA1162Y	AB
Q215	VSUN2213///-1	J	UN2213 (VC-M7E/M33E)	AA
Q501	VSUN2213///-1	J	UN2213 (VC-M7E)	AA
Q520	VS2SC2712Y/-1	J	2SC2712Y	AB
Q521	VS2SC2712Y/-1	J	2SC2712Y	AB
Q606	VS2SC2712Y/-1	J	2SC2712Y	AB
Q607	VS2SA1162Y/-1	J	2SA1162Y	AB
Q608	VS2C3939SQR-1	J	2C3939SQR	AC
$\Delta$ Q901	VS2SC4300//1	J	2SC4300 (VC-M2E/M7E/M33E)	AM
$\Delta$ Q901	VS2SC4517//1	J	2SC4517 (VC-M33DR)	AG
$\Delta$ Q902	VS2SC2001LK-1	J	2SC2001LK	AA
$\Delta$ Q903	VS2SC2001LK-1	J	2SC2001LK	AA
Q921	VS2SD468-C/-1	J	2SD468-C	AD
Q922	VSUN2113///-1	J	UN2113	AA
Q923	VSUN2211///-1	J	UN2211	AA
Q924	VS2SD468-C/-1	J	2SD468-C	AD
Q925	VSUN2113///-1	J	UN2113	AA

**VC-M2E/M7E**  
**VC-M33E/M33DR**

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>TRANSISTORS (Continued)</b>					<b>PACKAGED CIRCUITS</b>				
Q926	VSUN22111111-1	J	UN2211	AA	X501	RCRSB0166GEZZ	J	Crystal, 4.43MHz	AG
Q927	VS2SB1117KU1E	J	2SB1117KU	AE	X502	RCRSB0188GEZZ	J	Crystal, 3.58MHz (VC-M7E)	AG
Q928	VSUN22111111-1	J	UN2211	AA					
Q6113	VSUN21121111-1	J	UN2112	AA	X801	RCRSB0128GEZZ	J	Crystal	AF
			(VC-M33E/M33DR)						
Q6114	VSDTC143TK/-1	J	DTC143TK	AB					
			(VC-M33E/M33DR)						
Q6116	VSDTC143TK/-1	J	DTC143TK	AB					
			(VC-M33E/M33DR)						
Q6117	VS2SC2712Y/-1	J	2SC2712Y	AB					
			(VC-M33E/M33DR)						
Q8101	VSUN21111111-1	J	UN2111	AA					
Q8104	VSUN21111111-1	J	UN2111	AA					
<b>DIODES</b>					<b>COILS AND TRANSFORMERS</b>				
D202	VHD1SS11911-1	J	1SS119	AB	FL6101	RFILA0025GEZZ	J	Filter (VC-M33E/M33DR)	AD
D301	VHD1SS11911-1	J	1SS119	AB	L201	VP-XF151K0000	J	150μH	AB
D302	VHD1SS11911-1	J	1SS119	AB	L202	VP-XF150K0000	J	15μH	AB
D501	VHD1SS11911-1	J	1SS119	AB	L203	VP-XF330K0000	J	33μH	AB
D801	RH-PX0232GEZZ	J	Photo Diode	AF	L204	VP-XF120K0000	J	12μH	AB
D802	RH-PX0232GEZZ	J	Photo Diode	AF	L205	VP-XF820K0000	J	82μH	AB
D803	RH-PX0233GEZZ	J	Photo Diode	AD	L206	VP-ZK101K0000	J	100μH	AB
D804	RH-PX0233GEZZ	J	Photo Diode	AD	L207	VP-XF560K0000	J	56μH	AB
D805	VHD1SS11911-1	J	1SS119	AB	L208	VP-XF151K0000	J	150μH	AB
D808	RH-PX0231GEZZ	J	GP1S24	AF	L209	VP-XF560K0000	J	56μH	AB
D809	RH-PX0231GEZZ	J	GP1S24	AF	L210	VP-XF151K0000	J	150μH	AB
D810	RH-PX0234GEZZ	J	Photo Diode	AD	L212	VP-ZK101K0000	J	100μH	AB
△D901	RH-DX0083GEZZ	J	Diode	AC	L213	VP-ZK100K0000	J	10μH	AB
△D902	RH-DX0220CEZZ	J	Diode	AB	L301	VP-ZK101K0000	J	100μH	AB
△D903	VHDERA2206/-1	J	ERA2206	AC	L302	VP-ZK101K0000	J	100μH	AB
△D905	VHD1SS11911-1	J	1SS119	AB	L501	VP-ZK561K0000	J	560μH	AB
△D906	VHD1SS11911-1	J	1SS119	AB	L504	VP-XF150K0000	J	15μH	AB
△D907	VHD1SS14711-1	J	1SS147	AA	L505	VP-XF100K0000	J	10μH	AB
△D921	VHDERC3002L-1	J	ERC3002L	AB	L506	VP-XF390K0000	J	39μH	AB
△D922	VHDD1NS4111E	J	1NS4	AE	L508	VP-XF680K0000	J	68μH	AB
D923	VHD1A3-F111-1	J	1A3-F	AA	L509	VP-XF151K0000	J	150μH	AB
D924	VHD1A3-F111-1	J	1A3-F	AA	L601	VP-YF822J0000	J	8.2mH	AC
D925	VHD1SS11911-1	J	1SS119	AB	L602	VP-ZK221K0000	J	220μH	AB
D926	RH-EX0389GEZZ	J	Zener Diode	AA	△L901	RCILF0227GEZZ	J	33mH	AM
D927	RH-EX0151GEZZ	J	Zener Diode	AA	△L922	RCILP0161CEZZ	J	10μH	AD
D928	VHD1SS11911-1	J	1SS119	AB	△L923	RCILP0165CEZZ	J	22μH	AD
D929	VHD1SS11911-1	J	1SS119	AB	L6101	VP-ZK101K0000	J	100μH	AB
D6104	VHD1SS11911-1	J	1SS119	AB				(VC-M33E/M33DR)	
			(VC-M33E/M33DR)		L6102	VP-ZK101K0000	J	100μH	AB
D8101	VHD1SS11911-1	J	1SS119	AB				(VC-M33E/M33DR)	
D8102	RH-PX0352CEZZ	J	Photo Diode	AC	L6103	VP-ZK101K0000	J	100μH	AB
D8103	RH-PX0247GEZZ	J	Photo Diode	AB				(VC-M33E/M33DR)	
D8104	RH-PX0248GEZZ	J	Photo Diode	AB	L6104	VP-YF682J0000	J	6.8mH	AC
D8105	RH-PX0247GEZZ	J	Photo Diode	AB				(VC-M33E/M33DR)	
D8106	RH-PX0247GEZZ	J	Photo Diode	AB	T601	RTRNH0053GEZZ	J	Osc. Transformer	AE
D8109	VHD1SS11911-1	J	1SS119	AB	△T901	RTRNZ0055GEZZ	J	Osc. Transformer (VC-M2E/M7E/M33E)	AL
△IC902	RH-FX0005GEZZ	J		AE	△T901	RTRNZ0056GEZZ	J	Osc. Transformer (VC-M33DR)	AN
					<b>CONTROLS</b>				
					R272	RVR-M4796GEZZ	J	470k(B) FM Mod Adj. (VC-M7E/M33E)	AB
					R645	RVR-M4790GEZZ	J	47k(B) Bias Current	AC
					R889	RVR-M4419GEZZ	J	47k(B) Recording Phase	AB



Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS</b>					<b>CAPACITORS (Continued)</b>				
C201	VCKYCY1HB681K	J	680p 50V Ceramic	AA	C309	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C202	VCKYCY1HB391K	J	390p 50V Ceramic	AA	C310	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C203	VCCCCY1HH330J	J	33p 50V Ceramic	AA	C311	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C204	VCCCCY1HH150J	J	15p 50V Ceramic	AA	C312	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C205	VCCCCY1HH330J	J	33p 50V Ceramic	AA	C314	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C206	VCCCCY1HH560J	J	56p 50V Ceramic	AA	C315	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C207	VCCCCY1HH6R0D	J	6p 50V Ceramic	AA	C350	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C208	VCCCCY1HH560J	J	56p 50V Ceramic	AA	C501	VCKYCY1HB332K	J	3300p 50V Ceramic	AA
C209	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA	C503	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C210	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C504	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C211	VCCCCY1HH390J	J	39p 50V Ceramic	AA	C505	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA
C212	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB	C506	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C213	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA	C507	VCCCCY1HH121J	J	120p 50V Ceramic	AA
C214	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB	C508	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C215	VCCCCY1HH101J	J	100p 50V Ceramic	AA	C509	VCKYCY1HF153Z	J	0.015 50V Ceramic	AB
C216	VCCCCY1HH100D	J	10p 50V Ceramic	AA	C510	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C217	VCEAEA1HW105M	J	1 50V Electrolytic	AB	C511	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C218	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C512	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C219	VCKYCY1EB223K	J	0.022 25V Ceramic	AA	C513	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C220	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB	C514	VCKYCY1HF333Z	J	0.033 50V Ceramic	AA
C221	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C515	VCKYCY1CB273K	J	0.027 16V Ceramic	AA
C222	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C516	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C223	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB	C517	VCCCCY1HH180J	J	18p 50V Ceramic	AA
C224	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB	C519	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C225	VCEAEA1CW106M	J	10 16V Electrolytic	AB	C520	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C226	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB	C521	VCKYCY1EB223K	J	0.022 25V Ceramic	AA
C227	VCEAEA1CW106M	J	10 16V Electrolytic	AB	C523	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C228	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB	C525	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C229	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA	C526	VCCCCY1HH680J	J	68p 50V Ceramic	AA
C230	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB	C527	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C232	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C528	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C233	VCEAEA1HW105M	J	1 50V Electrolytic	AB	C529	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C234	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA	C530	VCCCCY1HH121J	J	120p 50V Ceramic	AA
C235	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB	C532	VCCCCY1HH221J	J	220p 50V Ceramic	AA
C236	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C533	VCCCCY1HH221J	J	220p 50V Ceramic	AA
C237	VCCCCY1HH330J	J	33p 50V Ceramic	AA	C541	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C238	VCCCCY1HH5R0C	J	5p 50V Ceramic	AA	C550	VCCCCY1HH8R0D	J	8 50V Ceramic	AA
C239	VCCCCY1HH560J	J	56p 50V Ceramic	AA	(VC-M7E)				
C240	VCKYCY1HB391K	J	390p 50V Ceramic	AA	C565	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C242	VCCCCY1HH560J	J	56p 50V Ceramic	AA	C566	VCKYCY1HB561K	J	560p 50V Ceramic	AA
C243	VCCCCY1HH330J	J	33p 50V Ceramic	AA	C601	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C244	VCCCCY1HH221J	J	220p 50V Ceramic	AA	C602	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C245	VCEAGA1CW476M	J	47 16V Electrolytic	AB	C603	VCFYSA1HB153J	J	0.015 50V M.Polyester	AA
C246	VCEAGA0JW477M	J	470 6.3V Electrolytic	AB	C604	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C247	VCEAGA1CW476M	J	47 16V Electrolytic	AB	C605	VCKYCY1HB392K	J	3900p 50V Ceramic	AA
C248	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C606	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C260	VCCCCY1HH101J	J	100p 50V Ceramic	AA	C607	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C269	VCKYD41HB121K	J	120p 50V Ceramic	AA	C608	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C271	VCKYD41CY103N	J	0.01 16V Ceramic	AA	C609	RC-QZA472TAYJ	J	4700p 50V Mylar	AB
C301	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C610	RC-QZA103TAYJ	J	0.01 50V Mylar	AB
C302	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C611	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C303	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C612	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C304	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C613	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C307	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C621	VCCCCY1HH331J	J	330p 50V Ceramic	AA
C308	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C622	VCCCCY1HH151J	J	150p 50V Ceramic	AA

**VC-M2E/M7E  
VC-M33E/M33DR**

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>					<b>CAPACITORS (Continued)</b>				
C623	VCCCCY1HH151J	J	150p 50V Ceramic	AA	△C905	RC-KZ0286CEZZ	J	4700p400V Ceramic	AB
C624	VCCCCY1HH560J	J	56p 50V Ceramic	AA	△C906	RC-KZ0286CEZZ	J	4700p400V Ceramic	AB
C625	VCKYCY1HB821K	J	820p 50V Ceramic	AA	△C907	RC-EZ0437GEZZ	J	68 400V Electrolytic (VC-M2E/M7E/M33E)	AK
C626	VCEAEA1CW106M	J	10 16V Electrolytic	AB	△C907	RC-EZ0440GEZZ	J	47 400V Electrolytic (VC-M33DR)	AH
C631	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	△C908	VCFYAG2GA333K	J	0.033 400V M.Polyester	AD
C632	VCEAGA1CW476M	J	47 16V Electrolytic	AB	△C909	RC-KZ0070GEZZ	J	56p 2kV Ceramic	AC
C633	VCKYCY1EB103K	J	0.01 25V Ceramic	AA	△C910	VCKYPA1HB221K	J	220p 50V Ceramic	AA
C634	VCKYCY1EB103K	J	0.01 25V Ceramic	AA	△C912	VCQYSH1HM562K	J	5600p50V Mylar (VC-M2E)	AB
C635	VCCCCY1HH221J	J	220p 50V Ceramic	AA	△C912	VCQYTA1HM562J	J	5600p50V Mylar (VC-M7E/M33E/M33DR)	AA
C636	VCQPSA2AA562J	J	5600p100V Mylar	AC	△C913	VCKYD41HB820K	J	82p 50V Ceramic (VC-M2E/M7E/M33E)	AA
C801	VCEAGA1CW476M	J	47 16V Electrolytic	AB	△C913	VCKYD41HB221K	J	220p 50V Ceramic (VC-M33DR)	AA
C802	RC-KZ0019GEZZ	J	0.1 Ceramic	AA	△C914	VCQYSH1HM473K	J	0.047 50V Mylar (VC-M2E)	AB
C803	VCE9GA1HW105M	J	1 50V Elect. (N.P)	AB	△C914	VCQYTA1HM473J	J	0.047 50V Mylar (VC-M7E/M33E/M33DR)	AA
C804	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C919	VCQYTA1HM102J	J	1000p50V Mylar	AA
C806	RC-KZ0019GEZZ	J	0.1 Ceramic	AA	C921	RC-QZ0107GEZZ	J	560p 100V Mylar	AC
C807	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	△C922	RC-EZ0445GEZZ	J	15 16V Electrolytic	AE
C809	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB	C923	VCEAGA1CW477M	J	470 16V Electrolytic	AC
C810	VCEAEA1HW105M	J	1 50V Electrolytic	AB	△C925	RC-EZ0446GEZZ	J	15 10V Electrolytic	AD
C812	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C926	VCEAGA0JW108M	J	1000 6.3V Electrolytic	AC
C813	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB	△C927	VCQYTA1HM472J	J	4700p50V Mylar	AB
C814	VCCCCY1HH101J	J	100p 50V Ceramic	AA	△C928	VCQYTA1HM102J	J	1000p50V Mylar	AA
C815	VCCCCY1HH101J	J	100p 50V Ceramic	AA	C929	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C816	VCCCCY1HH101J	J	100p 50V Ceramic	AA	C930	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C817	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C931	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C818	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C6101	VCKYCY1HB222K	J	2200p50V Ceramic (VC-M33E/M33DR)	AA
C820	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C6102	VCKYCY1HB222K	J	2200p50V Ceramic (VC-M33E/M33DR)	AA
C821	VCFYHA1HA334J	J	0.33 50V M.Polyester	AC	C6103	VCKYCY1CF104Z	J	0.1 16V Ceramic (VC-M33E/M33DR)	AA
C822	VCFYSA1HB333J	J	0.033 50V M.Polyester	AE	C6104	VCEAEA1HW224M	J	0.22 50V Electrolytic (VC-M33E/M33DR)	AB
C828	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C6105	VCCCCY1HH121J	J	120p 50V Ceramic (VC-M33E/M33DR)	AA
C829	VCEAEA0JW107M	J	100 6.3V Electrolytic	AB	C6106	VCEAGA1CW107M	J	100 16V Electrolytic (VC-M33E/M33DR)	AB
C830	VCCCCY1HH270J	J	27p 50V Ceramic	AA	C6107	VCEAEA1CW106M	J	10 16V Electrolytic (VC-M33E/M33DR)	AB
C831	VCCCCY1HH220J	J	22p 50V Ceramic	AA	C6108	VCEAEA1HW474M	J	0.47 50V Electrolytic (VC-M33E/M33DR)	AB
C832	VCKYCY1HB102K	J	1000p50V Ceramic	AA	C6109	RC-QZA153TAYJ	J	0.015 50V Mylar (VC-M33E/M33DR)	AB
C835	VCCCCY1HH331J	J	330p 50V Ceramic	AA	C6110	VCKYCY1CF104Z	J	0.1 16V Ceramic (VC-M33E/M33DR)	AA
C836	VCCCCY1HH101J	J	100p 50V Ceramic	AA	C6111	VCKYCY1HB102K	J	1000p50V Ceramic (VC-M33E/M33DR)	AA
C837	VCKYCY1HB102K	J	1000p50V Ceramic	AA					
C838	VCEAEA1CW106M	J	10 16V Electrolytic	AB					
C839	VCEAEA0JW336M	J	33 6.3V Electrolytic	AB					
C840	VCEAEA1HW105M	J	1 50V Electrolytic	AB					
C844	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA					
C845	VCCCCY1HH221J	J	220p 50V Ceramic	AA					
C848	VCCCCY1HH470J	J	47p 50V Ceramic	AA					
C849	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB					
C850	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB					
C851	VCKYCY1HB102K	J	1000p50V Ceramic	AA					
C852	VCEAGA0JW337M	J	330 6.3V Electrolytic	AB					
C866	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA					
C867	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA					
C871	VCCCCY1HH101J	J	100p 50V Ceramic	AA					
C878	VCKYD41CX152N	J	1500p16V Ceramic	AA					
C879	VCKYD41EF223Z	J	0.022 25V Ceramic	AA					
△C901	RC-FZ032CUMZZ	U	0.22 250V M.Polyester						
△C902	RC-KZ0286CEZZ	J	4700p400V Ceramic	AB					
△C903	RC-KZ0286CEZZ	J	4700p400V Ceramic	AB					
△C904	RC-KZ0286CEZZ	J	4700p400V Ceramic	AB					

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS (Continued)</b>					<b>RESISTORS (Continued)</b>				
C6112	VCEAEA1HW105M	J	1 50V Electrolytic (VC-M33E/M33DR)	AB	R202	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
C6113	VCEAEA1HW105M	J	1 50V Electrolytic (VC-M33E/M33DR)	AB	R203	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
C6114	VCEAEA1CW106M	J	10 16V Electrolytic (VC-M33E/M33DR)	AB	R204	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C6115	VCKYCY1HB562K	J	5600p50V Ceramic (VC-M33E/M33DR)	AA	R205	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
C6116	VCKYCY1HB392K	J	3900p50V Ceramic (VC-M33E/M33DR)	AA	R206	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C6117	VCCCCY1HH221J	J	220p 50V Ceramic (VC-M33E/M33DR)	AA	R207	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C6123	VCEAGA1CW106M	J	10 16V Electrolytic (VC-M33E/M33DR)	AA	R208	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
C6132	VCKYCY1HB821K	J	820p 50V Ceramic (VC-M33E/M33DR)	AA	R209	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
C6133	VCKYCY1EF153Z	J	0.015 25V Ceramic (VC-M33E/M33DR)	AA	R210	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
C6134	VCKYCY1HF223Z	J	0.022 50V Ceramic (VC-M33E/M33DR)	AB	R211	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
C6135	VCEAGA1HW474M	J	0.47 50V Electrolytic (VC-M33E/M33DR)	AA	R212	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
C6136	VCKYCY1CF104Z	J	0.1 16V Ceramic (VC-M33E/M33DR)	AA	R213	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
C6137	VCEAGA1CW107M	J	100 16V Electrolytic (VC-M33E/M33DR)	AB	R214	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
C6138	VCEAEA1AW476M	J	47 10V Electrolytic (VC-M33E/M33DR)	AB	R215	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
C6139	VCEAEA1HW105M	J	1 50V Electrolytic (VC-M33E/M33DR)	AB	R217	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
C6140	VCEAGA1HW105M	J	1 50V Electrolytic (VC-M33E/M33DR)	AC	R219	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
C6141	VCEAGA1CW476M	J	47 16V Electrolytic (VC-M33E/M33DR)	AB	R220	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
C6143	VCKYCY1CF683Z	J	0.068 16V Ceramic (VC-M33E/M33DR)	AA	R226	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
C6144	VCKYCY1EF153Z	J	0.015 25V Ceramic (VC-M33E/M33DR)	AA	R228	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
C6145	VCKYCY1CF104Z	J	0.1 16V Ceramic (VC-M33E/M33DR)	AA	R229	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
C6146	VCKYCY1CF104Z	J	0.1 16V Ceramic (VC-M33E/M33DR)	AA	R230	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
C6147	VCEAGA1HW474M	J	0.47 50V Electrolytic (VC-M33E/M33DR)	AA	R236	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-M7E/M33E)	AA
C6148	VCKYCY1HB222K	J	2200p50V Ceramic (VC-M33E/M33DR)	AA	R237	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide (VC-M7E)	AA
C6149	VCKYCY1HB222K	J	2200p50V Ceramic (VC-M33E/M33DR)	AA	R238	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide (VC-M7E)	AA
C6152	VCEAEA1HW104M	J	0.1 50V Electrolytic (VC-M33E/M33DR)	AB	R239	VRD-RA2EE221J	J	220 1/4W Carbon	AA
C8101	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R240	VRD-RA2EE181J	J	180 1/4W Carbon	AA
<b>RESISTORS</b>					R244	VRS-CY1JF750J	J	75 1/16W Metal Oxide	AA
R201	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA	R245	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
					R246	VRS-CY1JF750J	J	75 1/16W Metal Oxide	AA
					R247	VRS-CY1JF391J	J	390 1/16W Metal Oxide	AA
					R262	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
					R266	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
					R272	<i>See Control</i>			
					R273	VRS-CY1JF684J	J	680k 1/16W Metal Oxide (VC-M7E/M33E)	AA
					R302	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
					R303	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
					R304	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
					R305	VRD-RA2BE333J	J	33k 1/8W, Carbon	AA
					R306	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
					R307	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA
					R350	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
					R351	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
					R352	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
					R353	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
					R354	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
					R501	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
					R502	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
					R506	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
					R507	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
					R508	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
					R510	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA

**VC-M2E/M7E  
VC-M33E/M33DR**

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>					<b>RESISTORS (Continued)</b>				
R513	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R646	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R515	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA	R801	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R517	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA	R802	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R523	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R803	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R524	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R804	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R540	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R805	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R541	VRD-RA2BE102J	J	1k 1/8W Carbon	AA	R806	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R550	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA	R807	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R551	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA	R808	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R552	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA	R809	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R553	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R810	VRD-RA2HD1R0J	J	1 1/2W Carbon	AA
R554	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA	R811	VRD-RA2HD1R0J	J	1 1/2W Carbon	AA
R601	VRS-CY1JF181J	J	180 1/16W Metal Oxide	AA	R812	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R602	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA	R813	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R603	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA	R814	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R604	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA	R815	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R605	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA	R816	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R606	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA	R817	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R607	VRS-CY1JF105J	J	1M 1/16W Metal Oxide	AA	R818	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R608	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA	R819	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R609	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA	R820	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R610	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA	R821	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R611	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA	R822	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R612	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA	R823	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R613	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA	R827	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R614	VRS-CY1JF181J	J	180 1/16W Metal Oxide	AA	R828	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R615	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA	R829	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R616	VRS-CY1JF823J	J	82k 1/16W Metal Oxide	AA	R830	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R617	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R831	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R618	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA	R832	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R619	VRS-CY1JF820J	J	82 1/16W Metal Oxide	AA	R833	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R620	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA	R834	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R625	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA	R835	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
			(VC-M2E/M7E)		R836	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R625	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA	R837	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
			(VC-M33E/M33DR)		R838	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R626	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA	R839	VRS-CY1JF155J	J	1.5M 1/16W Metal Oxide	AA
			(VC-M2E/M7E)		R841	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R626	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA	R842	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
			(VC-M33E/M33DR)		R843	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R627	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA	R844	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R628	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA	R846	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R631	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA	R847	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R632	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA	R848	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R633	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA	R849	VRS-CY1JF155J	J	1.5M 1/16W Metal Oxide	AA
R634	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA	R850	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R635	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA	R851	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R636	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA	R853	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R637	VRD-RA2BE103J	J	10k 1/8W Carbon	AA	R856	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R638	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA	R858	VRD-RU2EE103J	J	10k 1/4W Carbon	AA
R640	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA	R859	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R642	VRG-SC2EB4R7J	J	4.7 1/4W Fuse Resistor	AB	R860	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R643	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA	R861	VRS-CY1JF823J	J	82k 1/16W Metal Oxide	AA
R644	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA	R862	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R645	<i>See Control</i>				R863	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA



Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R867	VRS-CY1JF274J	J	270k 1/16W Metal Oxide	AA
R868	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R869	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R870	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R871	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R872	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R873	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R876	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R885	VRS-CY1JF183J	J	18k 1/16W Metal Oxide (VC-M2E/M33DR)	AA
R886	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R887	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R888	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R889	See Control			
R899	VRG-SC2EB2R2J	J	2.2 1/4W Fuse Resistor	AB
△ R901	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
△ R902	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
△ R903	RR-WZ0002GEZZ	J	2.2 2W Cement (VC-M2E/M7E/M33E)	AD
△ R903	RR-WZ0003GEZZ	J	4.7 2W Cement (VC-M33DR)	AD
△ R904	VRD-RA2EE224J	J	220k 1/4W Carbon	AA
△ R905	VRD-RA2EE224J	J	220k 1/4W Carbon	AA
△ R908	VRD-RA2EE563J	J	56k 1/4W Carbon	AA
△ R909	VRS-VV3DB333J	J	33k 2W Metal Oxide	AA
△ R910	VRS-VV3DB333J	J	33k 2W Metal Oxide	AA
△ R911	VRD-RA2BE221J	J	220 1/8W Carbon	AA
△ R912	VRN-SV2HCR33J	J	0.33 1/2W Metal Film	AA
△ R913	VRD-RA2HD223J	J	22k 1/2W Carbon	AA
△ R914	VRD-RA2BE822J	J	8.2k 1/8W Carbon	AA
△ R915	VRD-RA2BE272J	J	2.7k 1/8W Carbon (VC-M2E/M7E/M33E)	AA
△ R915	VRD-RA2BE332J	J	3.3k 1/8W Carbon (VC-M33DR)	AA
△ R916	VRD-RA2BE681J	J	680 1/8W Carbon	AA
△ R917	VRD-RA2HD221J	J	220 1/2W Carbon	AA
R921	VRS-CY1JF330J	J	33 1/16W Metal Oxide	AA
R922	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R923	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R924	VRS-CY1JF330J	J	33 1/16W Metal Oxide	AA
R925	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R926	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R927	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R928	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R929	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R930	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R931	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
△ R932	VRN-RA2BK562F	J	5.6k 1/8W Metal Film	AA
△ R934	VRN-RA2BK562F	J	5.6k 1/8W Metal Film	AA
△ R935	VRD-RA2BE101J	J	100 1/8W Carbon	AA
△ R936	VRS-CY1JF271J	J	270 1/16W Metal Oxide	AA
△ R937	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R6101	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide (VC-M33E/M33DR)	AA

Ref. No.	Part No.	★	Description	Code
<b>RESISTORS (Continued)</b>				
R6102	VRS-CY1JF563J	J	56k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6103	VRS-CY1JF563J	J	56k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6104	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6105	VRS-CY1JF563J	J	56k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6106	VRD-RA2BE683J	J	68k 1/8W Carbon (VC-M33E/M33DR)	AA
R6107	VRS-CY1JF104J	J	100k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6108	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6109	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6110	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6111	VRS-CY1JF102J	J	1k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6112	VRD-RA2BE103J	J	10k 1/8W Carbon (VC-M33E/M33DR)	AA
R6114	VRS-CY1JF183J	J	18k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6115	VRS-CY1JF183J	J	18k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6116	VRS-CY1JF473J	J	47k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6117	VRS-CY1JF393J	J	39k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6118	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6119	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6120	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6121	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6123	VRS-CY1JF225J	J	2.2M 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6124	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6125	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6129	VRS-CY1JF223J	J	22k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6130	VRS-CY1JF823J	J	82k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6131	VRS-CY1JF563J	J	56k 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6132	VRS-CY1JF680J	J	68 1/16W Metal Oxide (VC-M33E/M33DR)	AA
R6133	VRS-CY1JF680J	J	68 1/16W Metal Oxide (VC-M33E/M33DR)	AA

**VC-M2E/M7E  
VC-M33E/M33DR**

Ref. No.	Part No.	★	Description	Code
<b>RESISTOR (Continued)</b>				
R6150	VRS-CY1JF473J	J	47k 1/16W Metal Oxide AA (VC-M33E/M33DR)	
R6162	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide AA (VC-M33E/M33DR)	
R6172	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide AA (VC-M33E/M33DR)	
R6173	VRS-CY1JF223J	J	22k 1/16W Metal Oxide AA (VC-M33E/M33DR)	
R8102	VRS-CY1JF181J	J	180 1/16W Metal Oxide AA	
R8104	VRS-CY1JF181J	J	180 1/16W Metal Oxide AA	
R8106	VRS-CY1JF271J	J	270 1/16W Metal Oxide AA	

**MISCELLANEOUS PARTS**

△	QACCV2050GEZZ	J	AC Cord (VC-M2E/M7E/M33E)	AM
△	QACCC3018GEZZ	J	AC Cord (VC-M33DR)	AM
FB601	RBLN-0043CEZZ	J	Ferrite Bead	AB
FB801	RBLN-0043CEZZ	J	Ferrite Bead	AB
FB802	RBLN-0043CEZZ	J	Ferrite Bead	AB
△FH901	QFSHD1009CEZZ	J	Fuse Holder	AA
△FH902	QFSHD1010CEZZ	J	Fuse Holder	AA
△F901	QFS-C2023CEZZ	J	Fuse, T2A/250V	AD
J201	QJAKH0002AJZZ	J	Jack, AV	AL
J6101	QJAKE0221GEZZ	J	Jack, Mic 1 (VC-M33E/M33DR)	AG
J6102	QJAKE0221GEZZ	J	Jack, Mic 2 (VC-M33E/M33DR)	AG
P201	QPLGN0428TAZZ	J	Plug, 4pin (TP201-204)	AB
P601	QPLGN0247REZZ	J	Plug, 2pin (AJ)	AA
P602	QPLGN0228TAZZ	J	Plug, 2pin (TP601-602)	AB
P801	QPLGN0247REZZ	J	Plug, 2pin (AB)	AA
P802	QPLGZ1074GEZZ	J	Plug, 10pin (AE)	AC
△P901	QPLGN0269GEZZ	J	Plug, 2pin (AP)	AB
RMCC8101	RRMCU0052GEZZ	J	R/C Receiver	AK
SC301	QSOCN0494REZZ	J	Socket, 4pin (AX)	AC
SC601	QSOCN0884REZZ	J	Socket, 8pin (AS)	AC
SC801	QSOCN0684REZZ	J	Socket, 6pin (AD)	AB
SC803	QSOCZ0484GEZZ	J	Socket, 4pin (AR)	AC
SC6101	QSOCN0594GEZZ	J	Socket, 5pin (AV) (VC-M33E/M33DR)	AB
S201	QSW-S0266GEZZ	J	Switch, NTSC Mode (VC-M7E)	AE
S202	QSW-S0173CEZZ	J	Switch, NTSC Mode (VC-M33E)	AD
S801	QSW-K0002AJZZ	V	Switch, Operate	AD
S802	QSW-K0002AJZZ	V	Switch, Stop/Eject	AD
S803	QSW-K0002AJZZ	V	Switch, Play	AD
S804	QSW-K0002AJZZ	V	Switch, FF	AD
S805	QSW-K0002AJZZ	V	Switch, REW	AD
S806	QSW-K0002AJZZ	V	Switch, Pause/Still	AD
S807	QSW-K0002AJZZ	V	Switch, REC	AD
S808	QSW-K0002AJZZ	V	Switch, P.R	AD
S810	QSW-S0266GEZZ	J	Switch, Colour Mode (VC-M2E/M33DR)	AE
S811	QSW-S0267GEZZ	J	Switch, Colour Mode (VC-M7E/M33E)	AG
S812	QSW-F0042AJZZ	V	Switch, REC Tip	AG

— End of Main —

**DUNTK5005XM50 (VC-M33E/M33DR)  
KARAOKE UNIT**

**CONTROLS**

R6701	RVR-B4371GEZZ	J	10k(B) Mic Volume	AD
R6702	RVR-B4371GEZZ	J	10k(B) Echo Volume	AD

**RESISTOR**

R6703	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide AA	
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**MISCELLANEOUS PART**

SC6701	QSOCN0595GEZZ	J	Socket, 5pin (VA)	AB
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— End of Karaoke —

**INFRARED REMOTE CONTROL UNIT**

RRMCG1063GESAJ	Infrared Remote Control Unit	AR
92PBAW11C201AJ	Battery Cover, Infrared Remote Control Unit	AE

— End of Infrared Remote Control Unit —

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>MECHANISM CHASSIS PARTS</b>					43	MLEVF0420GEZZ	J	Take-Up Loading Arm Ass'y	AG
1	LCHSM0148GEZZ	J	Main Chassis Ass'y	AY	44	NGERH1220GEZZ	J	Supply Loading Gear	AC
2	NROLP0084GEZZ	J	Supply Impedance Roller	AB	45	MLEVF0422GEZZ	J	Supply Loading Arm Ass'y	AG
3	PGIDH0031GEFW	J	Supply Impedance Roller Frange	AD	47	MSPRT0379GEFJ	J	Loading Double Action Spring	AB
4	PGIDS0027GEZZ	J	Supply Impedance Roller Lower Frange	AA	48	NDAiV1065GE00	J	Reel Disk	AB
5	NSFTL0563GEFW	J	Supply Impedance Roller Inner	AE	49	MARMP0053GEZZ	J	Reel Idler	AM
6	LPOLM0050GEZZ	J	Supply Pole Base Ass'y	AM	50	MLEVP0240GEZZ	J	Clutch Lever	AB
7	LPOLM0051GEZZ	J	Take-Up Pole Base Ass'y	AM	51	NGERH1221GEZZ	J	Clutch Gear Ass'y	AK
8	NROLP0110GEZZ	J	Guide Roller	AH	52	NPLYV0147GEZZ	J	Reel Pulley Ass'y	AP
9	MLEVF0414GEZZ	J	Reverse Guide Lever Ass'y	AG	53	NGERH1224GEZZ	J	Playback Gear	AD
10	MSPRD0147GEFJ	J	Reverse Guide Spring	AB	54	MLEVP0241GEZZ	J	Clutch Connect Arm	AB
11	PSPAZ0391GEZZ	J	Reverse Guide Spacer	AE	55	MLEVP0252GEZZ	J	Take-Up Main Brake Ass'y	AG
12	RHEDU0083GEZZ	J	Audio/Control Head	AR	56	MLEVP0249GEZZ	J	Take-Up Lock Lever	AC
13	MLEVF0415GEFW	J	Audio/Control Head Arm	AC	57	MLEVP0253GEZZ	J	Supply Main Brake Lever Ass'y	AE
14	MSPRD0148GEFJ	J	Audio/Control Head Arm Spring	AB	58	MSPRT0380GEFJ	J	Main Brake Spring	AB
15	MSPRC0189GEFJ	J	Azimuth Spring	AB	59	NGERH1225GEZZ	J	Cassette Hausing Control Drive Gear	AD
16	RHEDT0032GEZZ	J	Full Erase Head	AK	60	PREFL1004GEZZ	J	Light Guide	AD
17	PSPAZ0392GEZZ	J	Audio/Control Head Arm Spacer	AB	61	MLEVP0250GEZZ	J	Slow Brake Ass'y	AD
18	QPWBF4735GEZZ	J	Audio/Control Head PWB	AC	62	MSPRT0383GEFJ	J	Slow Brake Spring	AC
19	QSOCN0885REZZ	J	Socket, 8 pin	AB	63	RMOTN2052GEZZ	J	Capstan Motor	BD
20	NBLTK0065GE00	J	Reel Belt	AE	64	RMOTM1049GEZZ	J	Loading Motor	AP
21	MLEVF0416GEZZ	J	Pinch Roller Lever Ass'y	AU	65	QCNW-7501GEZZ	J	Lead Wire for Loading Motor	AE
22	MLEVP0237GEZZ	J	Pinch Double Action Lever	AD	66	QCNW-7500GEZZ	J	FFC for Audio/Control	AG
23	MLEVF0417GEZZ	J	Pinch Drive Lever Ass'y	AG	67	QCNW-7639GEZZ	J	FFC for Drum Motor	AF
24	NGERH1216GEZZ	J	Pinch Drive Cam	AE	76	DDRMV0039GE00	V	Drum Ass'y	BQ
25	MLEVP0238GEZZ	J	Open Lever	AC	78	PCAPS1026GEZZ	J	Worm Adjster	AB
26	MSPRT0377GEFJ	J	Pinch Double Action Spring	AC					
27	MSPRD0149GEFJ	J	Earth Spring	AB					
28	MLEVF0418GEZZ	J	Tension Arm Ass'y	AG					
29	LBOSZ1001GEZZ	J	Tension Arm Boss	AB					
30	MSPRT0378GEFJ	J	Tension Spring	AC					
31	LBNDK1008GEZZ	J	Tension Band Ass'y	AG					
32	NSFTP0032GEZZ	J	Tension Pole Adjust Cam	AB					
33	NGERH1217GE00	J	Master Cam	AE					
34	NPLYV0146GEZZ	J	Motor Pulley	AB					
35	NGERW1053GEZZ	J	Worm Gear	AC					
36	NGERW1052GEZZ	J	Worm Wheel Gear	AC					
37	NGERH1218GEZZ	J	Connect Gear	AC					
38	LANGK0161GEZZ	J	Loading Motor Angle Ass'y	AD					
39	NBRGP0023GEZZ	J	Bearing	AC					
40	MSLiP0006GEZZ	J	Sifter	AH					
41	MLEVF0419GEZZ	J	Sifter Drive Lever Ass'y	AG					
42	NGERH1219GEZZ	J	Take-Up Loading Gear	AD					

— End of Mechanism Chassis Parts —

VC-M2E/M7E  
VC-M33E/M33DR

Ref. No.	Part No.	★	Description	Code
<b>CASSETTE HOUSING CONTROL PARTS</b>				
300	CHLDX3070GE03	J	Cassette Housing Control Ass'y	AZ
301	LHLDX1024GE00	J	Frame (L)	AG
302	LHLDX1025GE00	J	Frame (R)	AG
303	NGERR3003GEFW	J	Drive Angle	AE
304	NGERR1005GEZZ	J	Double Action Rack	AC
305	MSPRT0381GEFJ	J	Double Action Spring	AC
306	MSLiF0070GEFW	J	Slider	AH
307	LHLDX1026GE00	J	Holder (L)	AD
308	MLEVP0246GE00	J	Proof Lever (L)	AB
309	MSPRD0150GEFJ	J	Proof Lever (L) Spring	AB
310	LHLDX1027GE00	J	Holder (R)	AD
311	MSPRP0159GEFJ	J	Cassette Spring	AD
312	MLEVF0424GEFW	J	Proof Lever (R)	AC
313	MSPRD0151GEFJ	J	Proof Lever (R) Spring	AB
314	NGERH1226GE00	J	Drive Gear (L)	AD
315	MSPRD0152GEFJ	J	Drive Gear (L) Spring	AC
316	NGERH1227GE00	J	Drive Gear (R)	AD
317	MSPRD0153GEFJ	J	Drive Gear (R) Spring	AC
318	NGERH1228GE00	J	Synchro Gear	AB
319	NSFTD0036GEFD	J	Main Shaft	AG
320	LANGF9570GEFW	J	Upper Plate	AH
321	MLEVP0247GE00	J	Door Open Lever	AC
322	MLEVP0248GE00	J	Sensor Lever	AB
323	MSPRT0382GEFJ	J	Sensor Lever Spring	AB
324	XHPSD30P06WS0	J	C3P + 6S (for Cassette Housing Control)	AA

— End of Cassette Housing Control Parts —

**SCREWS, NUTS AND WASHERS**

200	LX-XZ3030GEFD	J	Set Screw	AC
201	LX-BZ3095GEFD	J	Audio/Control Head Screw	AA
202	LX-BZ3096GEFD	J	Tilt Adjusting Screw	AA
203	XBPSD26P06000	J	Azimuth Adjusting Screw (2.6P + 6S)	AA
204	XHPSD26P08WS0	J	Screw, C2.6P + 6S (For FE Head)	AA
206	XBPSD30P04J00	J	Screw, SW3P + 4S (For Loading Motor)	AA
207	XHPSD26P06000	J	Screw, 2.6P + 6S (For Capstan Motor)	AA
208	XHPSD26P06WS0	J	Screw, C2.6P + 6S (For Loading Motor Angle Ass'y)	AA

Ref. No.	Part No.	★	Description	Code
209	XHPSD30P08WS0	J	Screw, C3P + 8S (For Drum Base)	AA
210	LX-NZ3046GEFW	J	X-Position Adjusting Nut	AB
211	LX-NZ3019GEZZ	J	Reverse Guide Adjusting Nut	AB
212	XNFSD40-31000	J	Audio/Control Head Adjusting Nut (M4)	AB
213	XNFSD20-16000	J	S.I. Roller Adjusting Nut (M2)	AA
214	XWHJZ52-05110	J	Washer, W5.2P-11-0.5 (Reel Height Adj.)	AB
215	XWHJZ52-03110	J	Washer, W5.2P-11-0.3 (Reel Height Adj.)	AB
216	XWHJZ52-04110	J	Washer, W5.2P-11-0.4 (Reel Height Adj.)	AB
217	XWHJZ52-06110	J	Washer, W5.2P-11-0.6	AB
218	XWHJZ52-07110	J	Washer, W5.2P-11-0.7	AB
219	XWHJZ31-02070	J	Washer, W3.1P-7-0.25	AA
220	LX-WZ1073GE00	J	Cut Washer, CW4.5P-11-0.5	AB
221	LX-WZ1006GE00	J	Cut Washer, CW2.6P-5.4-0.5	AA
222	LX-WZ1041GE00	J	Cut Washer, CW2.6P-6-0.5	AA
223	XRESJ40-06000	J	E-Ring, E-4	AA

— End of Screws, Nuts and Washers —

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
<b>MECHANICAL PARTS</b>					<b>FRONT PANEL PARTS</b>				
601	GCABA3095GESM	J	Top Cabinet	AQ	501	CPNLC1914GE01	J	Front Panel Ass'y (VC-M2E)	AX
602	GCABB1152GEZZ	J	Main Frame	AP	501	CPNLC1920GE01	J	Front Panel Ass'y (VC-M7E)	AY
603	LANGQ9057GEFW	J	Earth Angle	AC	501	CPNLC1917GE01	J	Front Panel Ass'y (VC-M33E)	AY
604	JKNBP1071GESA	J	Slide SW Knob	AC	501	CPNLC1919GE01	J	Front Panel Ass'y (VC-M33DR)	AY
605	JKNBK1084GESA	J	Vol. Knob (VC-M33E/M33DR)	AG	501-1	HBDGB1008AJSA	V	SHARP Badge	AE
606	GCOVA1874GEZZ	J	Antenna Cover (VC-M2E)	AE	501-2	HDECP0240GESA	J	Foot Decoration	AD
606	GCOVA1876GEZZ	J	Antenna Cover (VC-M7E)	AE	501-3	HDECQ1266GESA	J	Front Decoration	AH
606	GCOVA1872GEZZ	J	Antenna Cover (VC-M33E)	AE	501-4	HDECQ1267GESA	J	Cassette Flap (VC-M2E)	AH
606	GCOVA1875GEZZ	J	Antenna Cover (VC-M33DR)	AD	501-4	HDECQ1274GESA	J	Cassette Flap (VC-M7E)	AH
607	LHLDP1150GEZZ	J	LED Holder	AD	501-4	HDECQ1272GESA	J	Cassette Flap (VC-M33E)	AH
608	LHLDZ1925GEZZ	J	R/C Holder	AC	501-4	HDECQ1273GESA	J	Cassette Flap (VC-M33DR)	AH
609	PSPAZ0473GEZZ	J	Spacer	AB	501-5	JBTN-2634GESA	J	Operate Button	AD
610	LHLDZ1924GEZZ	J	PWB Holder (VC-M33E/M33DR)	AD	501-6	JBTN-2632GESA	J	Mode Button	AD
611	LX-HZ3030GEFF	J	Screw	AA	501-7	MSPRD0103GEFJ	J	Cassette Spring	AB
612	XEBSD30P12000	J	Screw	AA	501-8	PSPAZ0467GEZZ	J	Vol. Spacer (VC-M33E/M33DR)	AC
613	XHPSF30P08WS0	J	Screw	AA	501-9	TLABZ1134GEZZ	J	Feature Label (VC-M2E)	AD
614	XESSF30P12000	J	Screw	AA	501-9	TLABZ1145GEZZ	J	Feature Label (VC-M7E)	AD
615	XEBSD40P12000	J	Screw	AA	501-10	HDECZ0005GESA	J	Cassette Decoration (VC-M7E)	AE
616	XHPSD30P06WS0	J	Screw	AA	<b>— End of Front Panel Parts —</b>				
617	PSLDM4449AJFW	V	Shield Case (Top)	AD					
618	PSLDM4450AJFW	V	Shield Case (Bottom)	AD					
619	PSLDM4469AJFW	V	Shield Case	AD					
620	LANGQ9060GEFW	J	Cabinet Earth Angle						
621	XBPSD26P06WS0	J	Screw	AA					

**SUPPLIED ACCESSORIES****ACCESSORIES**

QCNW-2702GEZZ	J	75ohm Coaxial Cable	AK
RMICD0012GEZZ	J	Microphone (VC-M33E/M33DR)	AV

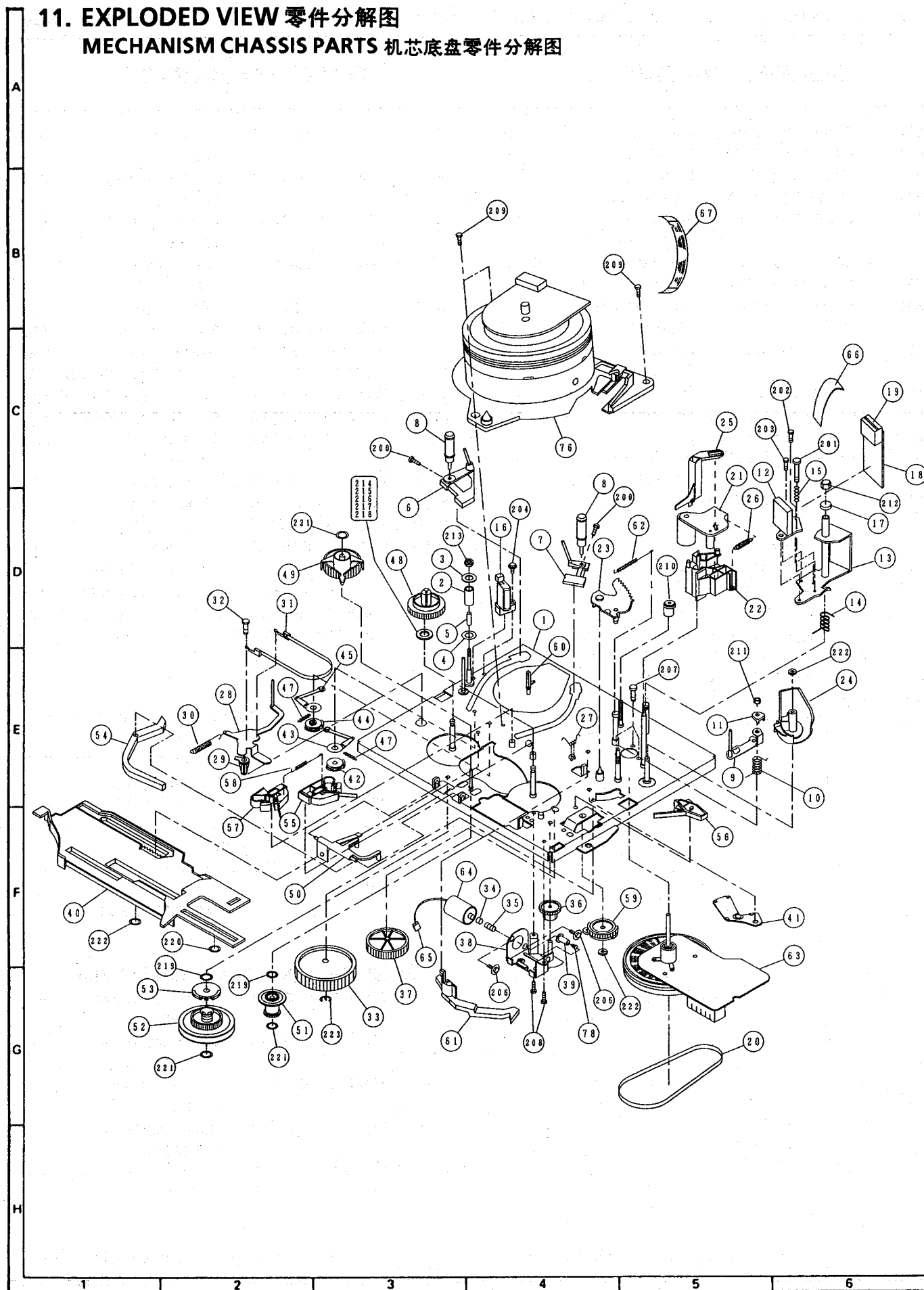
**ACCESSORIES (NOT REPLACEMENT ITEM)**

TiNS-2470GEZZ	-	Operation Manual (VC-M2E)	—
TiNS-2474GEZZ	-	Operation Manual (VC-M7E)	—
TiNS-2472GEZZ	-	Operation Manual (VC-M33E)	—
TiNS-2473GEZZ	-	Operation Manual (VC-M33DR)	—
TCADS3003CEZZ	-	SS List (VC-M33DR)	—

**— End of Mechanical Parts —****— End of Supplied Accessories —**

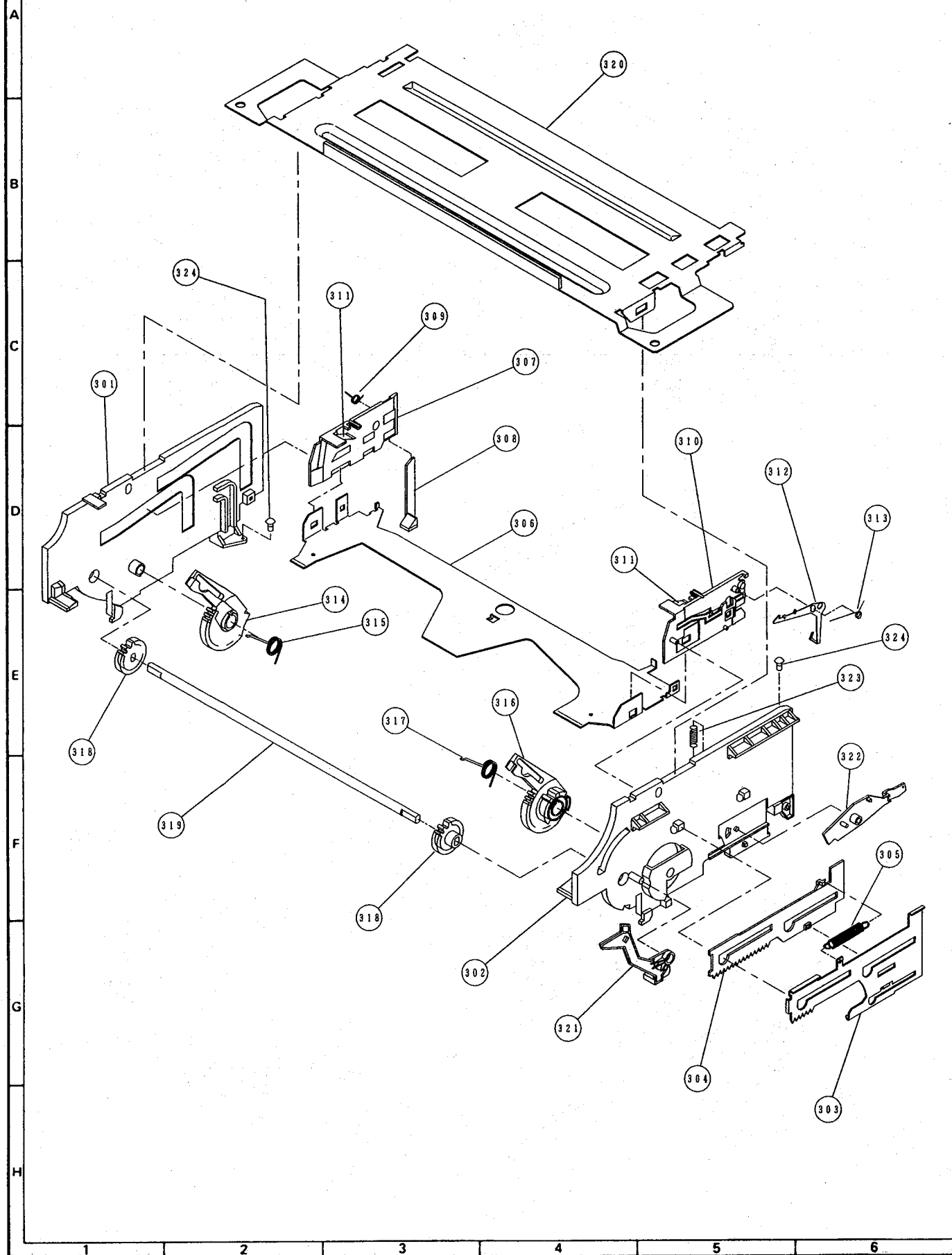
# 11. EXPLODED VIEW 零件分解图

## MECHANISM CHASSIS PARTS 机芯底盘零件分解图

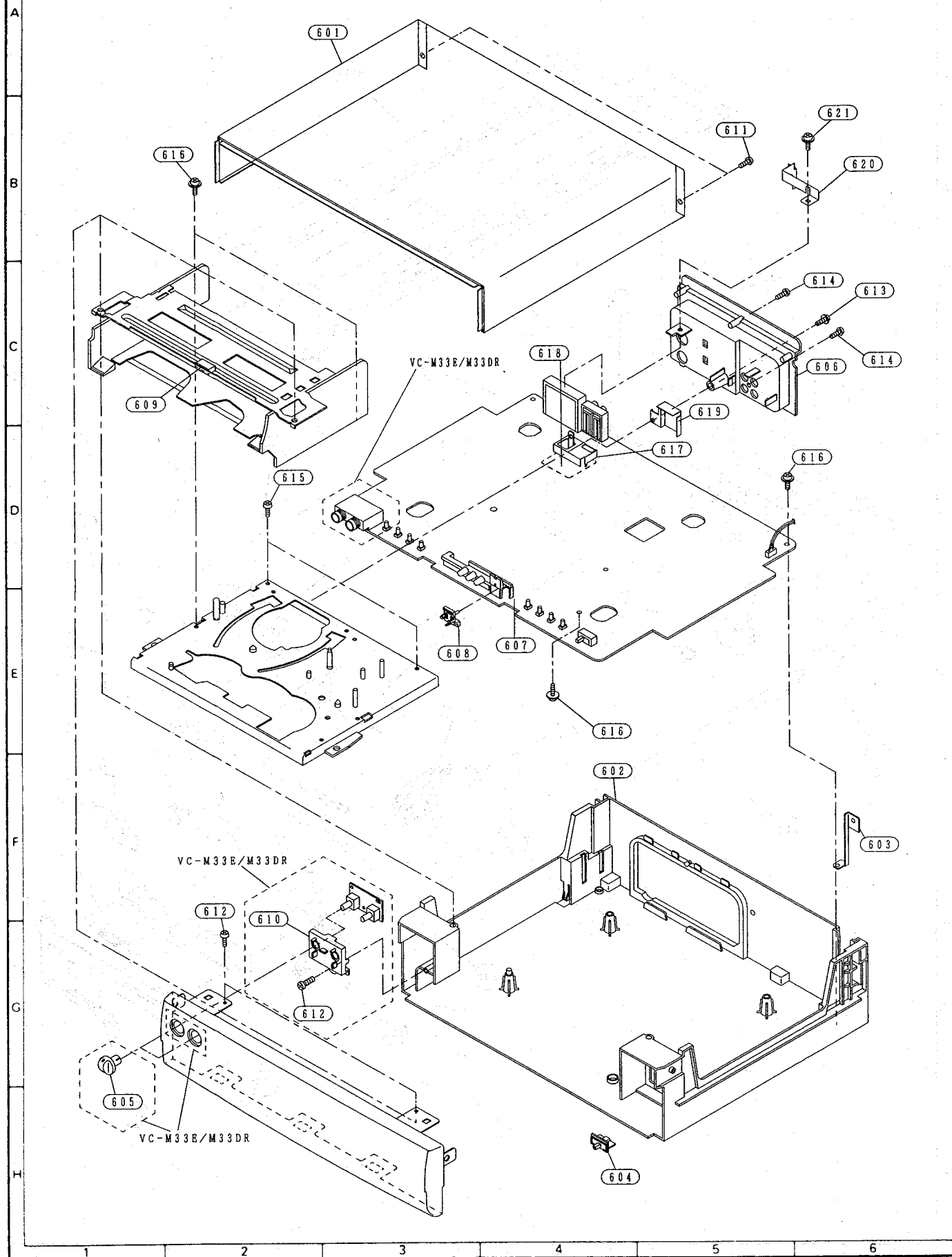


# CASSETTE HOUSING CONTROL PARTS

## 盒室机构控制零件分解图

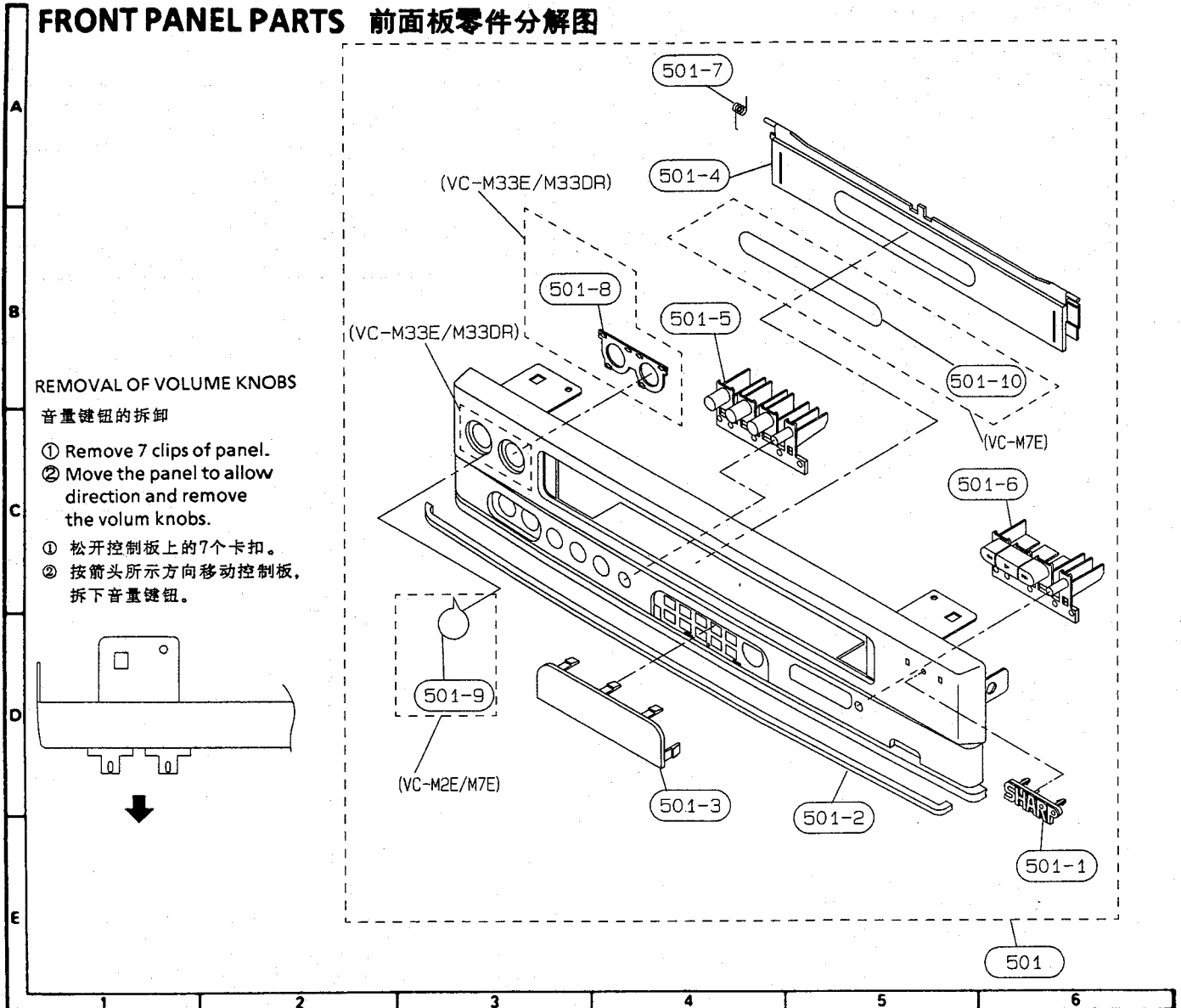


# MECHANICAL PARTS 机械零件分解图





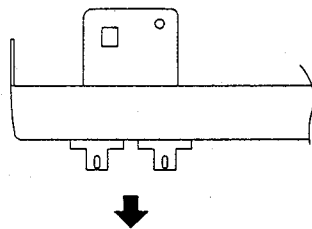
## FRONT PANEL PARTS 前面板零件分解图



### REMOVAL OF VOLUME KNOBS

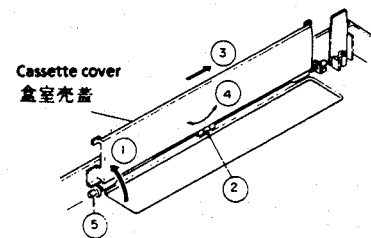
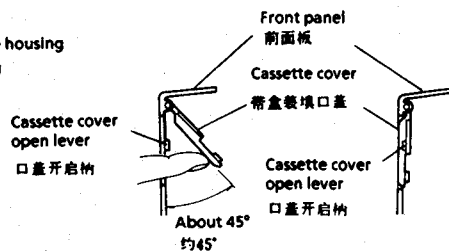
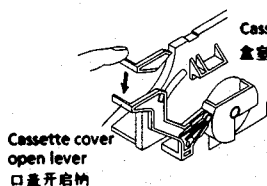
#### 音量键钮的拆卸

- ① Remove 7 clips of panel.
- ② Move the panel to allow direction and remove the volum knobs.
- ① 松开控制板上的7个卡扣。
- ② 按箭头所示方向移动控制板，拆下音量键钮。



## PRECAUTIONS ON FRONT PANEL SET-UP

### 前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启杆是否置于正当位置（最下位置），否则，用手指向下按压口盖开启杆。

Keep the cassette over about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态，然后确认口盖开启杆位于前面板与带盒装填口盖之间，这样便可将前面板安装在预定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette

带盒装填口盖开启度过大时，切勿安装前面板，否则装填装置将于盒室机构内时，会导致其口盖开闭动作不当。

Removing the cassette compartment cover.

- ① Open the cassette compartment cover fully.
- ② Remove the center positioner.
- ③ Slide the cover to the right.
- ④ Slightly bend the cover.
- ⑤ Draw out the left-side rod.

盒室壳盖的拆除

- ① 完全打开盒室壳盖。
- ② 拆下中心位置控制器。
- ③ 向右侧移动盒室壳盖。
- ④ 稍微把盒室壳盖倾斜。
- ⑤ 取出左侧杆。

## 12. PACKING OF THE SET 包装方法

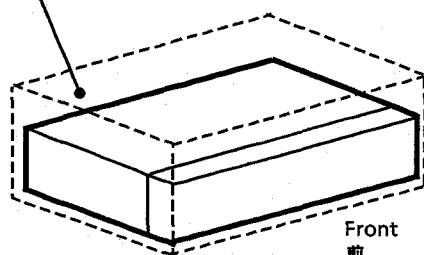
### ● Setting position of the Knobs ● 各旋钮设定方法

RF Converter (VC-M2E/M7E/M33E) 射频变换器输出电路	at "E39" position 频道为 "E39"	RF Converter (VC-M33DR) 射频变换器输出电路	at "E38" position 频道为 "E38"
NTSC Mode Switch (VC-M7E/M33E) NTSC制式选择开关	at "NT→PAL TV" position "NT→PAL TV" 位置	——	——
System Switch (VC-M2E/M7E/M33E) 系统开关	at "B/G, D/K" position "B/G, D/K" 位置	System Switch (VC-M33DR) 系统开关	at "I-D/K" position "I-D/K" 位置

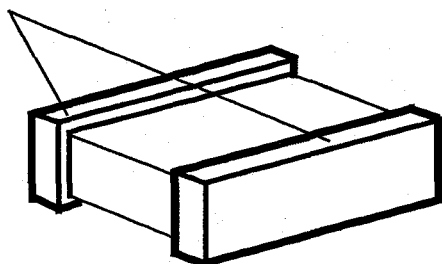
#### ★ Accessories ★ 附属品

- ★ TiNS-2470GEZZ Operation manual  
使用说明书 (VC-M2E)
- ★ TiNS-2474GEZZ Operation manual  
使用说明书 (VC-M7E)
- ★ TiNS-2472GEZZ Operation manual  
使用说明书 (VC-M33E)
- ★ TiNS-2473GEZZ Operation manual  
使用说明书 (VC-M33DR)
- QCNW-2702GEZZ 75 ohm coaxial cable  
天线延长引线
- RMICD0012GEZZ Microphone  
麦克风 (VC-M33E/M33DR)
- ★ TCADS3003CEZZ SS list  
住址名簿 (VC-M33DR)
- Battery  
干电池

- ★ SPAKP0084GEZZ  
Polystyrene sack  
聚苯乙烯薄模袋



- ★ SPAKX0916GEZZ (VC-M2E/M7E)
- ★ SPAKX0915GEZZ (VC-M33E/M33DR)  
Buffer material  
防震泡沫塑料衬垫

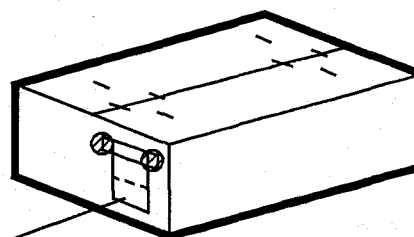
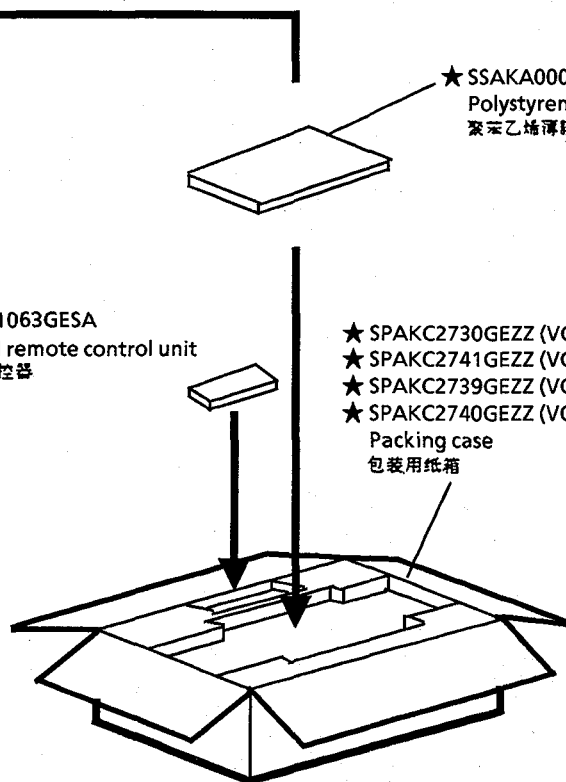


- ★ Not Replacement Items  
★ 记号者为非更换品目

- RRMCG1063GESA  
Infrared remote control unit  
红外线遥控器

- ★ SSAKA0003GEZZ  
Polystyrene sack  
聚苯乙烯薄模袋

- ★ SPAKC2730GEZZ (VC-M2E)
- ★ SPAKC2741GEZZ (VC-M7E)
- ★ SPAKC2739GEZZ (VC-M33E)
- ★ SPAKC2740GEZZ (VC-M33DR)
- Packing case  
包装用纸箱



- ★ TLABK2866GEZZ (VC-M2E)
- ★ TLABK2892GEZZ (VC-M7E)
- ★ TLABK2890GEZZ (VC-M33E)
- ★ TLABK2891GEZZ (VC-M33DR)
- No. card  
出厂编号标签

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